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AUTHOR	Garret, Max Mehlis; Rorex, A. Rexford
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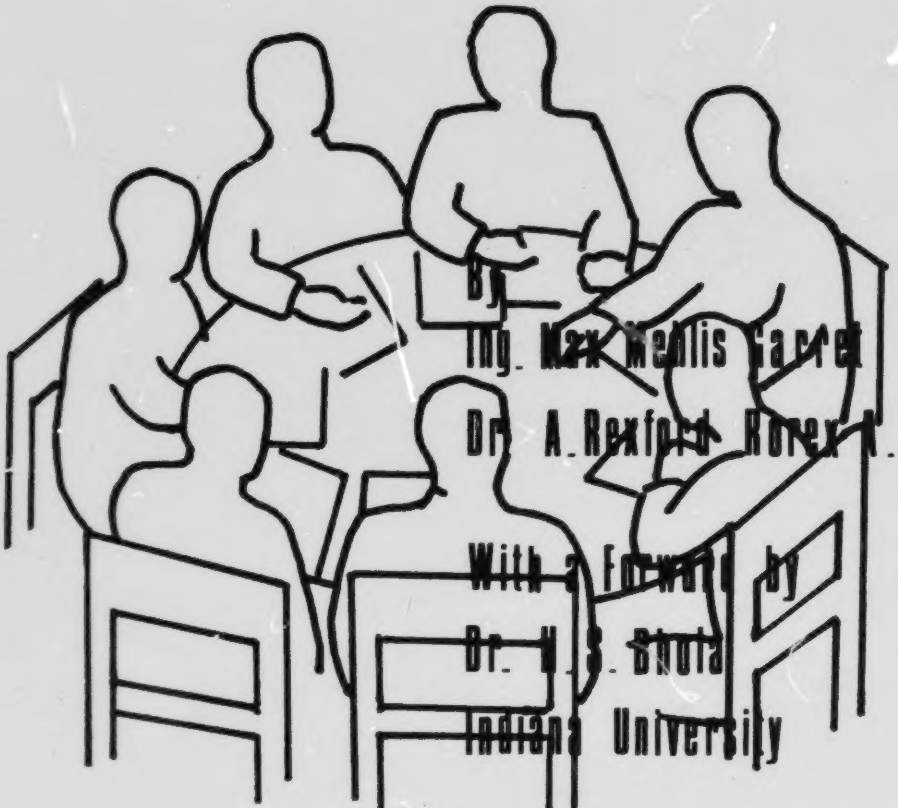
ABSTRACT

The administrative information and communication system for public education in Bolivia has been a matter of concern to the authors for several years. This report is the outgrowth of that concern. Part 1 describes the present communications/information system and concludes that there is a weak infrastructure together with a total lack of integration in educational administration communication at the national, district, and local levels. Part 2 addresses the requirements for an effective system for Bolivia including the need to bring urban and rural schools into a common communication network. Part 3 presents a series of recommendations for restructuring and strengthening the nation's communication/information system. Both technological and organizational changes are indicated. Some requirements for successful implementation are also presented. (DGC)

COMMUNICATION AND INFORMATION NEEDS FOR EFFECTIVE ADMINISTRATION OF THE BOLIVIAN SYSTEM OF PUBLIC INSTRUCTION

A REPORT AND DESIGN



By
Ing. Max Mellis Garret
Dr. A. Rexford Rorex N.

With a Forward by
Dr. H. S. Bhola
Indiana University

Ministry of Education and Culture - La Paz - Bolivia - 1974

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BY

ING. MAX MEHLIS GARRET AND
DR. A. REXFORD ROREX A.

With the Collaboration of
Lic. Fedor Espinosa Noriega
With a Forward by
Dr. H. S. Bhola
Indiana University

Under the Auspices of

The Council for Administrative Rationalization -
    Lic. Hugo Alborta Alvarez Daza - Director
The Advisory Group of the San Jose (California) State University Foundation, Inc.
    Dr. Raul E. Oñoro Amador - Chief of Party
    Dr. Gene Lamb - Campus Coordinator.

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FOREWORD

The report by Max Mehlis and Rex Rorex which follows analyzes the existing communication patterns within the administrative sector of the Bolivian system of public instruction across and between the national, district and local levels; brings out the current modes of information-generation and information-utilization within the total system; and makes recommendations about how the existing situation might be improved, to enable the administrative system to be more responsive to the educational needs of Bolivian society.

To appreciate the study as a research effort, and to evaluate its findings and recommendations in regard to future actions, a frame-of-reference would be useful -- even necessary. This we present, in the following, in rather parsimonious detail.

Development is Organizationally-Mediated

Whatever needs to be done systematically seems to require a system. When societies decide to take systematic actions, with some continuity in view, they create permanent or semi-permanent systems of action. Most often, these systems of action are what we call organizations. Most social action -- whether in the area of health, or agriculture, or education, or defense -- is thus organizationally-mediated. Whether it is a new developmental program or a significant innovation in an existing social program, organizations must be created to deliver the new services, or existing organizations must be adapted to become capable of actualizing the innovation.

Understandably, the San Jose Mission (during its two and one-half years of technical assistance, February, 1972, to June, 1974) and now the USAID Loan to Bolivia (which, at the time of writing, is being seriously negotiated) have both emphasized the "organizational" within the Bolivian educational system. This makes particular sense in Bolivia, where the structure of public administration could perhaps be classified as semi-institutionalized.

Since organizations stand between human intentions and human actions, as well as between the decision-makers and the clients and communities which the decision-makers want to serve, organizations can help efforts of development and reconstruction, or organizations can block such efforts. When organizations are functional and effective, they can implement new visions, reconstruct communities, bring prosperity where there was hunger. On the other hand, when organizations are dysfunctional and ineffective, they can lose all sense of direction; become blind to the objectives which they may have been initially established to fulfill; become incapable of action, and waste scarce and valuable resources; and, most importantly, they can make a community, society or nation literally miss the future.

Conceptualizing An Organization

Organization is a system of roles and rules for relating those roles to each other, provided with resources to fulfill obligations to an environment in which it is placed and with which it interacts. Organizational change can thus occur when new roles are invented or existing roles are changed; when rules for relating those roles (that is, patterns of communication and compliance) are changed; when organizational resources are increased or diminished, when environment puts new demands and pressures on the organization; or when one or more of these factors change synergetically in regard to an organization.

To change an organization for the better, we must have an idea of what a good organization is. Criteria for "goodness" can differ. First, they can differ from sector to sector; an organization in the defense sector will have to be judged differently for goodness than an organization in the commercial sector. Similarly, an organization in the educational sector will have to be judged somewhat differently for goodness than a trading corporation. Again, cultural contexts and political cultures of societies within which organizations exist will generate somewhat particularized criteria for goodness.

Educators with humanistic values would agree, however, that educational organizations should be effective and that they need not be cruel in trying to be effective. In other words, organizations should be designed so that they can effectively and efficiently discharge the duties which they were assigned by the society to perform; and so that they can provide opportunities to those who work within those organizations to reconcile their personal goals with organizational goals and identify themselves with the organization. As students of organizational design or administrative reform, we should be concerned with both of the following:

(a) The Social Architecture of the Organization, and

(b) The Technical Architecture of the Organization.

Good social architecture within an organization would require, minimally, that: (a) There be a shared organizational vision among all the role performers within the organization at all the different levels, and a shared commitment to organizational goals; (b) There exist an emotive identification with the organization on the part of all role incumbents, so that each can engage in criticism of the organization and evaluation of its objectives without assuming a stance of rejection; and (c) There be mutual trust among different role incumbents and mutual respect among them, involving acceptance of both each other's strengths and weaknesses. While all this cannot result from only greater communication across and between various administrative levels within an organization, good social architecture cannot come about without communication.

Good technical architecture within an organization would require, minimally, that: (a) The organization have designed roles appropriate for performing technical tasks of the organization, role incumbents be trained for task performance, and there be a proper division of work within particular role configurations (task forces, sections, units, etc.); (b) There be proper linkages among role incumbents across and between various organizational levels to govern mutual expectations of communication and compliance; (c) The organization be responsive to its social-cultural environment, but not the helpless victim of that environment (because if organizations did not sometimes flout existing environments or create new environments, they would never be innovative); and (d) The organization effectively manage the resources made available to it for fulfilling its social role.

Again, while communication alone would not be a sufficient condition for creating a technically effective organization, communication is necessary if technical effectiveness is to be possible at all. The organization for public insturction in Bolivia must make good decisions; these decisions must be informed decisions (that is, they must be based on valid information), and they must be communicated across the system for compliance and testing.

Scope and Contribution of the Study

The Study by Max Mehlis and Rex Rorex addresses itself to the twin questions of communication and information which, as we have indicated, are the necessary (though not sufficient) conditions for creating organizations which have excellent social architecture and which are effective in their tasks of generating policy, implementing planned actions, and monitoring the impact of their policies, plans and actions. The study thus addresses itself to a most significant aspect of innovation and change in Bolivian education.

The Study has three parts:

PART I - Description of the present communications/information system within the Bolivian educational system. (The emphasis is on administrative communication and information.);

PART II - Requirements for an effective communications/information system for the Bolivian educational system; and

PARTIII - Suggested plan for a new administrative communications/information system for the Bolivian system of public instruction.

Max Mehlis addresses himself primarily to the questions of information-generation, storage, retrieval and use, while Rex Rorex has supplied insights on the more general aspects of communication within the system. Together they have produced some interesting data -- a systematic and rather comprehensive profile of the system's communication and information-handling behaviour.

A question which is sometimes asked by laymen or by harried administrators with no time to read big research reports is: What did you find that is new? What did you find that I did not know before? Those indeed are questions about the function of research itself, rather than about a particular research study. To answer these questions, we should indicate that research -- while it might often find something new, suggest new ways of looking at old issues, or disprove what we always thought was right -- might as often merely confirm our hunches and our commonsense view of reality. It is not to suggest that there is nothing new in the Mehlis-Rorex Study, but to indicate that it should not be underestimated, simply because -- at times -- it merely confirms what we knew already, in some intuitive way. The Study, at least for this writer, confirms a large part of what was known before only intuitively and impressionistically, and it provides new confidence for any recommendations which might be made, in regard to communication/information aspects for the organization. By presenting quantified data on the various aspects of the communication/information behaviour of the system, the Study provides a solid basis for both argument and action.

A Brief Review of Findings

The findings of the study must be put in perspective, to keep them from reading like a collection of horror stories. It should be stated, for example, that ineffective, dysfunctional organizations are not peculiar to Bolivia. Most of the developing world has sick organizations, though the malady may differ from one country to another. Nor is the so-called developed world immune to organizational malaise. Again, we must realize the fact that the Bolivian system of public instruction does have an organization; there are teachers who are in classrooms, there are supervisors in localities, zones and districts, and there is a Ministry in La Paz, full of officials. They are all receiving their salaries (sooner or later) and performing some tasks (well or poorly). Unfortunately, the system is working at perhaps less than one-third of its capacity, with the existing resources. It could do much better.

We would not attempt to repeat here the findings presented in the report, but only include a most succinct summary.

We might recollect that the study deals only with the administrative communications/information aspects of the system. However, since the administrative information does include information on students in classes, teachers employed, number of schools, and student enrollment information, it clearly has pedagogic uses.

The communication/information system within the Bolivian educational system is found to be sustained by a weak communication infrastructure. Roads are bad, telephone communication is not at one's fingertips; mail takes weeks to reach its destination; telegraph and air mail services are both expensive and infrequent. This makes the system unreliable and slow.

There is a lack of integration within the total system, with the result that the system is unable to develop a consensus about a collective sense of direction for policy initiatives or for implementing plans. At the national level, for example, there is little inter-communication between departments of the Ministry. While dispersal of physical facilities hinders this communication; there is also a lack of will to interact.

There is poor distribution of work among the departments, and different departments get in on the same act; for example, purchasing and distribution of didactic materials is handled by more than one department. Within the same Division, sections and units work in isolation from each other, like rebel states within the union! Collegiality is seldom present; good communication skills are not part of the managerial culture.

At the district level, again, there is little inter-communication among persons within district offices, or between the Rural and Urban Directors within the same district. Instead of collegiality, adversary relationships exist. Orientation is to communicate vertically -- upward or downward, not across. Among the nine district departments, communication is practically unknown.

The information network can be seen to have a centralized orientation, with too much information reaching the highest point, thus creating an overload at the Minister's level. There are no codified rules about how far information will go and how it will be used. The flow is one way: From the periphery to the center. If the locality or the district needs a response, someone must travel from there to La Paz and extract the response in person.

Information reaches the central level at different points, and it comes in different formats. Each point at the center receives the information and often stores it without making use of it. It is never shared with other points at the center (which receive their own sets of data from the same sources at the district and local levels). Sometimes, information must be reclassified before it can be used, because of the unsuitability of the format in which it is received. There is information storage, but there is little retrieval of information for use. The information which does come in is incomplete. In many cases, information is reported only for the urban sector, and not for the rural sector. Economic and financial data are conspicuous by their absence.

The data-generating sources have to duplicate their efforts, since many different points at the national level are for the same information. Often, as many as 18 copies of the same information have to be reproduced by hand. Often, local and zonal supervisors short-circuit the information flow in the system, by sending information directly to the center and keeping the district officials unaware of developments.

The results in human terms are most unhappy. The isolation of the rural teacher is crippling. The financial burdens of travelling at one's own cost -- to get the response one must get in order to be able to draw salary or get a certificate -- are unjust. Visitors from the provinces fill the central offices in La Paz, making it impossible for officials to work. At the lower end some Habilitados live parasitically on teachers, charging them heavy fees for undertaking communication tasks which should be a normal part of the system.

Good descriptions have indeed built-in prescriptions, and several interesting ideas should suggest themselves to careful readers of the report. Mehlis and Rorex have not, however, left everything to suggestion, but have made specific recommendations, including:

a. Development of a systematic computerized information system (manual to begin with) to fulfill both the administrative and policy analysis and assessment needs of the system.

b. Infrastructural support to the system by provision of buildings at the national and district levels; of cars, motorcycles, motorboats, and bicycles to various functionaries; installation of an elaborate two-way radio system between center and districts, and between districts and zones; purchase of duplication equipment, and provision for official travel, postage and telegraph services.

c. Further institutionalization of roles and rules including codification of the division of responsibilities; need for more discipline regarding office hours and communication with outsiders; correspondence control systems, and regular staff meetings; and transfer of supervisors into the zones, closer to their work.

d. Academic/Pedagogical stimulation of the system through professional congresses at various levels of the system, and the publication of a newsletter for educators and administrators.

All these recommendations require support -- some soon, some a little later -- after their feasibilities have been investigated and their priorities evaluated, in relation to other needs of the system which may be competing in terms of urgency.

In introducing the report to administrators (who would surely find in the data presented here new convictions for actions, and in the recommendations some helpful directions), I would like to add the weight of my own opinions:

1. Design of the Information System

The "design phase" of the information system-building must be put in effect immediately. A task force should be created with representation from all the various activities (salaries, personnel, budget control, etc.), to redesign forms, tabulations, report formats, etc., and lines of information flow should be established, as suggested by Max Mehlis in his report.

Subsequent phases of the information system may be undertaken, as and when computer terminals become a reality at the district level. The spirit of my commentr is that the design and installation of a systematic manual information system (convertible into a mechanized system at will) should not be delayed any further.

1.1 A suitable correspondence control system should be designed and installed as part of the information system design. Both incoming and outgoing mail should have reference numbers and be recorded on issue and on receipt.

2. Codification of Communication Rules

Information system design requires further institutionalization of the system along the lines suggested in the report. However, an immediate beginning must be made by developing a resolution on the division of responsibilities between the central levels, and in the transfer of a appropriate decision-making powers to district officials. This transfer of powers must be included in suitable decrees. If such a set of decrees -- transferring powers to divisional officials -- is not obtained, but the computerized information system is set up, then there may be further centralization within the system -- rather than decentralization -- and we might be defeating our own purposes.

3. Educational Inputs and Stimulation

Once all the various recommendations regarding the administrative reform have been implemented, we will have a fully-wired network; the next step should be to have some high voltage current flowing through it. That is, technical/pedagogical information must flow through this network.

3.1 In this respect, the newsletter proposed here (and recommended earlier in this author's consultancy reports: "Towards Communication and Consensus with the Bolivian Educational System", January, 1973; and "Structures of Commitment and Action: Next Steps in Bolivian Education", January, 1974) assumes special significance.

Its role in bringing all the teachers, school directors and administrators within the Bolivian educational system together into a professional community, and bringing them in touch with innovative ideas should be obvious to anyone. The newsletter can indeed be used as an important tool for training. Such a newsletter should not be merely a bulletin for administrators, but also an educator's newsletter. At a later date, it should develop into a quarterly journal of Bolivian education.

3.2 The local level conferences, district level congresses (with invited speakers talking to groups) is a useful idea to stimulate the system professionally.

Related with it is the idea of a Central Advisory Board of Education for Bolivia (again, first proposed by this author in his January, 1973, report and re-affirmed in the January, 1974, report). Such a Board, if established, can:

- Give education visibility in regard to its deserved role in society's development;
- Bring all the various interested groups into the educational policy-formulation process;
- Make all policy-making a systematic process, reviewed and projected year by year; and
- Give the Ministry of Education and the districts a sense of direction, implementation schedules, and criteria for performance.

3.3 As part of the overall training effort to be undertaken, emphasis must be put on communication skills. The Sucre and Tarija institutes, for example, should teach not only formal aspects of communication and management, but also the human aspect: How to develop cohesive groups? How to interact within groups? How to be sensitive to the feelings of others and of oneself?

I generally support -- subject to feasibility studies, wherever necessary -- the recommendations about physical structures and communication infrastructures. And I do hope that the report is actually used for planning and decision-making in the whole area of administrative reform, for it is a good profile of the communication behaviour of the educational system. This Study should have been performed two and one-half years ago; thus, for the purposes of the San Jose Mission, this report comes much too late. But, for mounting the educational programs under the USAID Loan, it is just in time.

La Paz, Bolivia
June 1, 1974

H. S. Bhola
Indiana University

HSB: bbr

PREFACE

Background of the Study

The need has long existed for a thorough study to provide the basis for design of a new communication/information system for the administrative area of the Bolivian educational system. As early as April, 1972, the San Jose Mission endeavored to contract the services of Ing. Max Mehlis Garret, to conduct such a study; the attempt was vetoed by the then Minister of Education and Culture.

Efforts were resumed following the arrival in March, 1973 of Dr. A. Rexford Rorex A., as a member of the San Jose Mission resident staff, responsible for the areas of communications and administrative training.

During the following months, due to the failure to appoint a CRA counterpart in communications, the only progress made in this area was Dr. Rorex's design for data-collection and a basic study. In late August, 1973, Ing. Mehlis was finally contracted by the Mission, to function, essentially, as a counterpart for Dr. Rorex. The data-collection instrument designed earlier was combined with the already developed and tested methods of Ing. Mehlis, and the study began in September. In late October, Lic. Fedor Espinosa, San Jose Mission Technician, was added to the group. The study was conducted on the national level September-December, 1973, and in three of the priority districts (Sucre, Cochabamba and Santa Cruz) in January - February, 1974; various discrepancies in information between the two levels required further collection of data in La Paz in March, leading to the study's completion. The final report and design were drafted in April and May, 1974.

Throughout the eight month period, numerous difficulties were encountered: The lack of adequate personnel (all three of the persons involved could devote no more than half-time to the study); the unfortunate delay in carrying the study to the districts (scheduled for November-December, 1973, it was postponed to January-February, 1974); and the myriad travel difficulties in the districts, during the rainy season. The chief obstacle, however, was the lack of cooperation on the part of various, national-level administrators.

The most obvious example of this was a particular high-level administrator, who caused a full three-week delay in the study schedule; either he was not in his office and would never return calls, or he would say that he was too busy to meet at a given time, or -- as was usually the case -- he would schedule a meeting with the investigators and then not attend, never leaving word in his office as to his reasons or whereabouts.

A very serious menace to the success of the study arose in December, 1973, and -- during the following months -- threatened to undermine the effort completely. Mistakenly believing that a computer would be the panacea for all of the Ministry of Education's communications problems, and failing to take into account that there was no existing information by which one could even establish the exact computer needs of the Ministry, one high official seriously considered committing the Ministry to join with the universities (through CNES) in purchasing a computer system which was manifestly inadequate for the combined needs of both parties. Fortunately, the plans were not implemented.

The difficulties involved indeed slowed and hindered the work, making it more difficult; but they did not stop it. The following pages contain the information gathered in the study, as well as the final product of the over-all effort: The design for a new communications/information system.

Introduction

If one were obliged to choose a single word to describe the system of communications which exists within the administrative apparatus at all levels of Bolivia's educational system, that word would have to be waste. The system does function: Communications are sent, received, and responded to; data is collected and dispatched; necessary transactions are completed; people and materials move from one place to another; meetings are held; contacts are made. But the low level of efficiency in the completion of systemic functions produces a concomitantly low level of results -- results which are totally out of proportion with the amount of time, effort, and human and financial resources needed to make the system work. Bolivia can ill-afford such waste. With proper planning, modification, and implementation, the same resources which now are being squandered can be put to optimal use and can produce optimal results.

The transition will not be an easy one. It will not entail merely the expenditure of money, the re-training of personnel, the need to familiarize oneself with new equipment and methods. It will also require a fundamental change in thinking and personal style on the part of high officials in the system, a willingness to share power and -- thus -- to see their personal power diminished. It will call for discipline, scrupulousness, and even self-sacrifice on the part of many district and local officials. It will necessitate formalization, regularity, and order -- which are presently lacking.

If some of the suggestions in the following report seem somewhat extreme, it is because the seriousness of the situation calls for extreme measures and solutions. The future quality of Bolivian education -- and the quality of the products of that education -- is and will be largely dependent upon the quality and efficiency of the system's administrative apparatus; this is the basic rationale for administrative rationalization. And efficient communications must be an integral part of administrative rationalization.

The study upon which this report is based was conducted by Ing. Max Mehlis Garret, Dr. A. Rexford Rorex A., and Lic. Fedor Espinoza Noriega, and the report was written by Messrs. Mehlis and Rorex. However, the greatest portion of credit must go to Ing. Mehlis. His data-collection methods were used for most aspects of the study, and he personally performed most of the work involved. This report, therefore, is primarily the fruit of his efforts.

Thanks must be given to those officials -- on the national, district, and local levels -- who cooperated with the investigations by giving the time and information required of them. (Indeed, we are even appreciative of those persons who refused to cooperate, as their recalcitrance pointed out several system deficiencies.)

Finally, special thanks must go to Barbara Barone Rorex, who contributed her technical assistance to the preparation of this report, and who typed the bulk of the draft and the final copy.

This document is submitted with the sincere hope that this product of our efforts will indeed provide the basis for a new communications/information system, and that our labor will be rewarded by seeing that system implemented.

A. Rexford Rorex A.
Deputy Chief, San Jose Mission
La Paz - June, 1974

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  - 4.1 Activities

5.0 Additional Comments: The Communication Chain

- 5.1 Ministry - District Directorate
- 5.2 Within the District Directorate
- 5.3 District Directorate - Schools/Nucleos
- 5.4 Within Schools and Nucleos
- 5.5 Between Nucleos and Seccionales
- 5.6 Ministerial Level

6.0 Appendices

- 6.1 Samples of descriptive documents used in the study.
- 6.2 Memorandum, From: Max Mehlis Garret; To: Raul E. Oñoro Amador; Date: February 28, 1974; Subject: Salary Preparation and Payment Procedures Employed in the Urban District of Santa Cruz.

1.0 INTRODUCTION

1.1 Purpose and Scope

1.1.1 The purpose in describing the present communications/information system within the Bolivian educational system and the respective Ministry of Education and Culture is to:

1.1.1.1 Allow the mapping of the present communication network existing within and among the administrative sections of the Ministry of Education.

1.1.1.2 Determine what information is used by administrators in decision-making and task-performance.

1.1.1.3 Determine the manner in which this information is elaborated, collected, transmitted, analyzed and interpreted, used, stored and retrieved.

1.1.1.4 Allow an assessment of the adequacy and deficiencies of the present communication network and of all aspects of the information content and the use made of it.

1.1.2 The scope of the study is limited ot the administrative area of the Ministry of Education and Culture and to the administrative aspects of the rural and urban districts, supervisors, school directors and teachers. The specific areas and offices covered by this study are as follows:

1.1.2.1 The Direction of Administration; the departments covered under this direction are:

1.1.2.1.1 Department of Scholastic Technical Support (SATE)
1.1.2.1.2 Department of Administrative Personnel
1.1.2.1.3 Direction of Financial Administration
1.1.2.1.4 Department of Services to Teacher Personnel
1.1.2.1.5 Department of Purchases, Supplies and Assets

1.1.2.2 Department of Archives and Information

1.1.2.3 Direction of Educational Planning (and its Divisions)

1.1.2.4 Department of Public Relations

1.1.2.5 Internal Audit Office

1.1.2.6 National Direction of Curriculum

1.1.2.7 The urban and rural district offices of three departments:

1.1.2.7.1 Cochabamba
1.1.2.7.2 Santa Cruz
1.1.2.7.3 Sucre

1.2 Methodology

In order to undertake the study of the present communication/information system, a methodology of recording and analyzing existing operations was employed. This methodology consists of five descriptive documents. They are logically organized and clearly segregated, and they identify the key information needed; therefore, they simplify the portraying of dynamic procedures on static documents. The relationship between the documents is illustrated in Figure 1.2. In the analysis of the various departments and offices within the Ministry of Education -- with respect to the communications/information systems -- not all the documents were used every time. This is because they are an instrument of variable magnifying power, and their flexibility extends in several directions, such as the length and size of the study, the depth of penetration, and the level of refinement.

The five documents are briefly described and listed below; a sample of each is included in Appendix 6.1.

DOCUMENTATION STRUCTURE

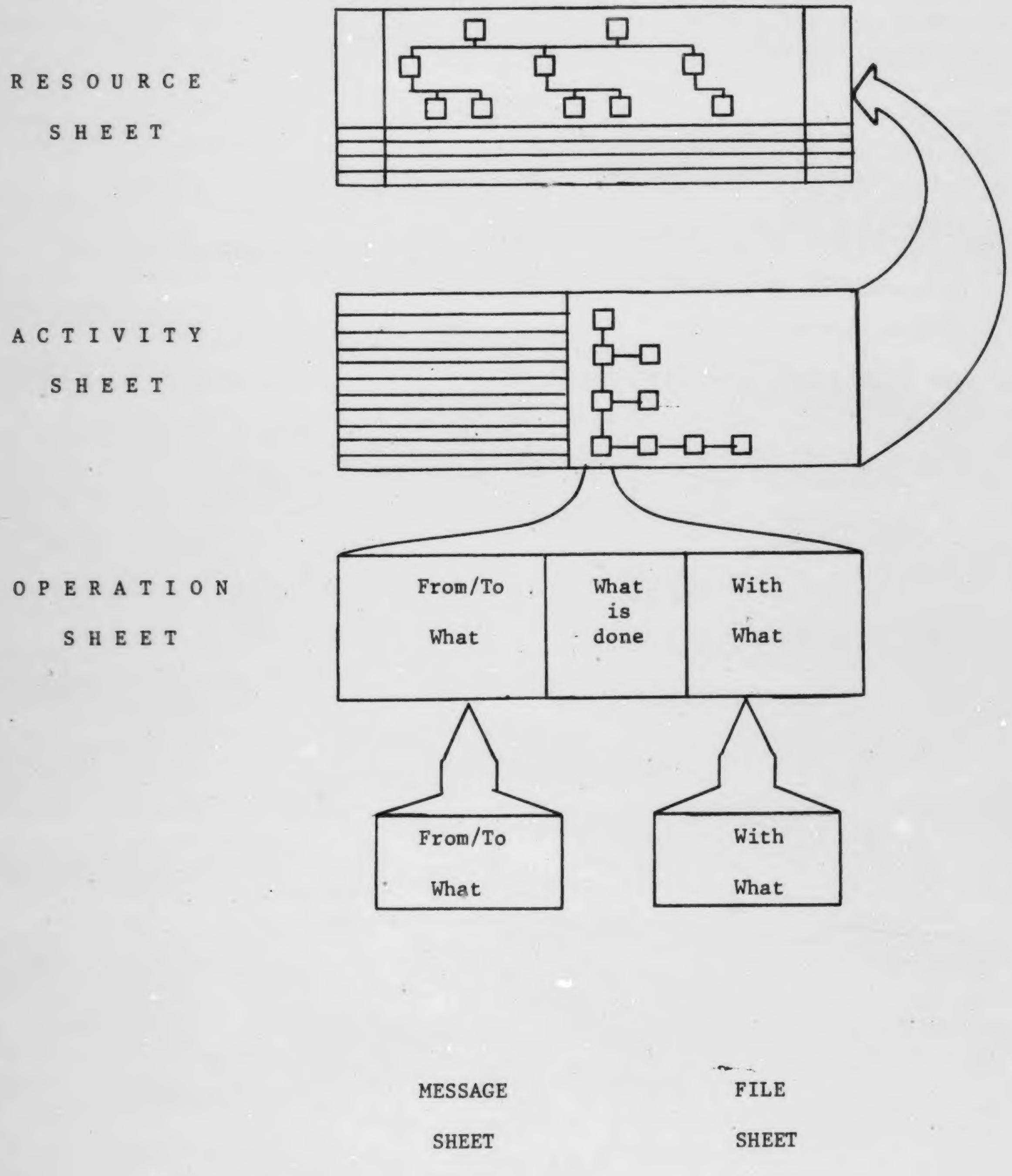

RESOURCE SHEET
ACTIVITY SHEET
OPERATION SHEET
From/To What
What is done
With What
From/To What
With What
MESSAGE SHEET
FILE SHEET

FIGURE 1.2

1.2.1 Resource Sheet (provides the organizational structure and resources available .)

1.2.2 Activity Sheet (contains a flow diagram of the activity and gives key information about inputs, outputs and information files.)

1.2.3 Operation Sheet (records significant operations, within the activity, in more detail.)

1.2.4 Message Sheet (records the inputs and outputs, or communication entering or leaving an operation, regardless of the transmission medium.)

1.2.5 File Sheet (identifies and examines a data or information file with an operation or activity.)

1.3 Content

The remainder of Part 1 is subdivided into five sections, including the general section, the structural section, the operational section, additional comments and the appendices.

1.3.1 The General Section is further subdivided into a history subsection, a goals and objectives subsection, and a policies and practices subsection.

1.3.1.1 History

This part of the report is an identification of major milestones or events of progress which influenced the present administrative direction of the Ministry of Education.

1.3.1.2 Goals and Objectives

This subsection attempts to identify the goals and objectives of the Ministry of Education, regardless of whether they are documented.

1.3.1.3 Policies and Practices

This subsection gives some of the main policies and practices which directly affect the implementation of the actual goals and objectives.

1.3.2 The Structural Section is concerned with three of the four major elements of the current communication/information system: Inputs, outputs and resources. (The fourth element, operations, is covered in the operational section.) This section is subdivided into a model subsection, data outputs and users subsection, data inputs and sources subsection, and a resources subsection.

1.3.2.1 Communications/Information Systems Model

The model of the communications/information system sets up the framework for the Structural Section and establishes a classification system for displaying data.

1.3.2.2 Data Outputs and Users

The data outputs are analyzed, along with the users who utilize these outputs.

1.3.2.3 Data Inputs and Sources

The data inputs are analyzed, along with the sources of the data.

1.3.2.4 Resources

Resources are examined in terms of personnel and corresponding organizational data, information inventories or files and facilities, as they relate to the present communications/ information system.

1.3.3 The Operational Section describes the operating dynamics in the framework of activity classifications. Time, flow and sequence of events are important factors identified in this part of the study.

1.3.3.1 Time

Time data is recorded within operations and also for the entire activity.

1.3.3.2 Flow and Sequence

Operations within an activity are plotted in a flow diagram, along with inputs, outputs, and file resources, to demonstrate the flow and sequence of events in the present communications/information system.

1.3.4 The "Additional Comments" section provides a narrative commentary on aspects of the communications/information system which are not covered in earlier sections.

1.3.5 The Appendices contain a sample of each of the five documents employed in recording and analyzing the existing operations.

1.4 Summary of Findings

The findings of the present communications/information systems study are summarized in three sections: Communications, information, and resources.

1.4.1 Communications

Overall communications are highly unreliable, with excessive delay times. The contributing factors to the above are:

- The lack of an adequate communications system within the Ministry at the national level.
- An excessive physical decnetralization (also at the national level) of departments and offices; for example, a department is sometimes physically located in two or three different buildings.
- The failure to segregate employees, teachers and the general public within the working areas of many offices and departments. The same is true in many district offices, particularly the rural ones.
- An excessive amount of time spent communicating between offices and departments at the national level -- i.e. going from one office to another, because there are no telephones available, or because the offices are in different locations.
- The fact that, in distant and isolated districts, communication is limited to aircraft, as in the case of Pando.
- The existence of more than one communications channel for the same type of activity. The districts send identical data to several departments and offices at the national level.

- The distribution of rural schools, which is very haphazard with respect to rural districts.
- Too much detail communicated to the Minister for his personal action; most of this is in the form of certificates for teacher personnel. (The certificates are for roster inscription, category, service time, titles, etc.)

1.4.2 Information

In general terms, information is highly repetitious, unavailable, late, inaccurate and not distributed. For example:

- Statistical information is generally unknown at the national level.
- Economic and financial data is practically unavailable.
- The national level receives identical data from the district offices and from the supervisory level in the district. This is very common in the urban districts, but not so in the rural districts.
- There is an excessive number of copies prepared for most data documents. Salary sheets are prepared with 16 to 18 copies.
- In some cases, data is prepared only for urban activities and not rural activities. All the information prepared by the Department of General Inspection of School Administration is for the urban area.
- The lack of information and data is one of the major causes for low productivity on the part of teacher personnel.
- Statistical information, in its present form, is not very usable; there are many pages of numbers which require additional processing to obtain meaningful information.
- There are very few users of the current statistical data, and

they do not know how to use the data.

1.4.3 Resources

As a whole, resources are underused, duplicated, excessive in some instances and inadequate in others.

- Information inventories or files are excessive and duplicated in the Teacher Personnel Department, while they are inadequate in the Administrative Personnel Department.
- The salary files at CENACO are incomplete, as too many salaries are paid manually by the Accounting Division.
- Financial files are almost non-existant. The ones which do exist reflect budget expenditures only. There is no budget control involved.
- The scholastic materials distribution file is in working order, but it requires centralizing -- as do the materials. Distribution of scholastic materials is undertaken by several different departments.
- The two printing facilities are duplicated and underused.
- Purchasing of materials and goods is performed independently by several offices and departments.
- The information file in the Archives and Information Section is used for registering urban personnel records only.

2.0 GENERAL

2.1 History

In April, 1970, a supreme law was enacted, transferring the rural educational system from the Ministry of Rural Affairs to the Ministry of Education and Culture. Up to this time, educational services were highly concentrated and better developed in the urban area, which was already under the Ministry of Education. In the rural area, educational services were characterized by their feudal aspects. Later, a group of internal consultants in administrative techniques provided a first attempt at an organizational and functional manual for the Ministry of Education. As part of this effort, a Job Classification Plan and Salary Plan were prepared. These documents rationalized the existing salary structures and divided them, in terms of teacher personnel and administrative personnel; the separation of teacher personnel and salaries from administrative personnel and salaries was a fundamental change in the Ministry of Education. Prior to this, highly qualified teacher personnel also performed administrative functions, with the consequent dual salaries and retirement benefits.

In November, 1971, the San Jose State University Foundation was contracted to provide administrative advisory services to the various areas in educational administration.

In March, 1972, an amendment was added to the above contract, to include the implementation phase of any administrative reform which should result from the contracted services. As part of this amendment, an administrative unit was created to serve as a counterpart to the advisory group from San Jose State University Foundation; this unit was named the Council of Administrative Rationalization - CRA.

Through joint efforts of the San Jose State University advisory group (generally refered to as the San Jose Mission) and the CRA, an administrative reform is currently in progress.

2.2 Goals and Objectives

2.2.1 Administrative Deficiencies

The goals and objectives of the administrative structure within the Ministry of Education have been primarily geared toward the technical-pedagogical activities of the Ministry -- i.e. to provide educational services to the school population on a nation-wide basis. Over the past years, and including 1973, the administrative structure has failed in its principal objective, even though there have been past attempts at administrative reform. The magnitude of failure is such that the administrative structure is characterized by many deficiencies, some of which are listed below.

2.2.1.1 92% of the educational budget goes for salaries.

2.2.1.2 Any increase in financial resources is a direct function of the number of teachers graduated from the normal schools.

2.2.1.3 There is a concentration of financial resources in the urban area.

2.2.1.4 There is excessive centralization and concentration in the central administration.

2.2.2 Administrative Reform Goals and Objectives

As a consequence of the administrative reform, some of the goals and objectives are as follows:

2.2.2.1 Organizational and functional development of the central administration.

2.2.2.2 Rationalization of administrative methods, procedures, and processes in the central administration.

2.2.2.3 Provision of the necessary mechanisms and elements for efficient planning, organization, direction and control of the educational services.

2.2.2.4 Complete development and implementation of administrative systems, at the advisory and support levels.

2.2.2.5 Design and application of rational administrative policies to the economic, personnel, facilities and inventories resources of educational services.

2.3 Policies and Practices

Up to 1973, all internal policy was made known through the vehicle of Ministerial Resolutions, which are signed by the Minister.

General overall policy -- and, in many instances, internal policy -- was made known through the use of Supreme Resolutions, which are signed by the President of the Republic.

From 1973, to date, the use of functional and operational manuals covering aspects of internal operations have come into increasing use. These were rarely employed previously, and -- when provided -- they were not used.

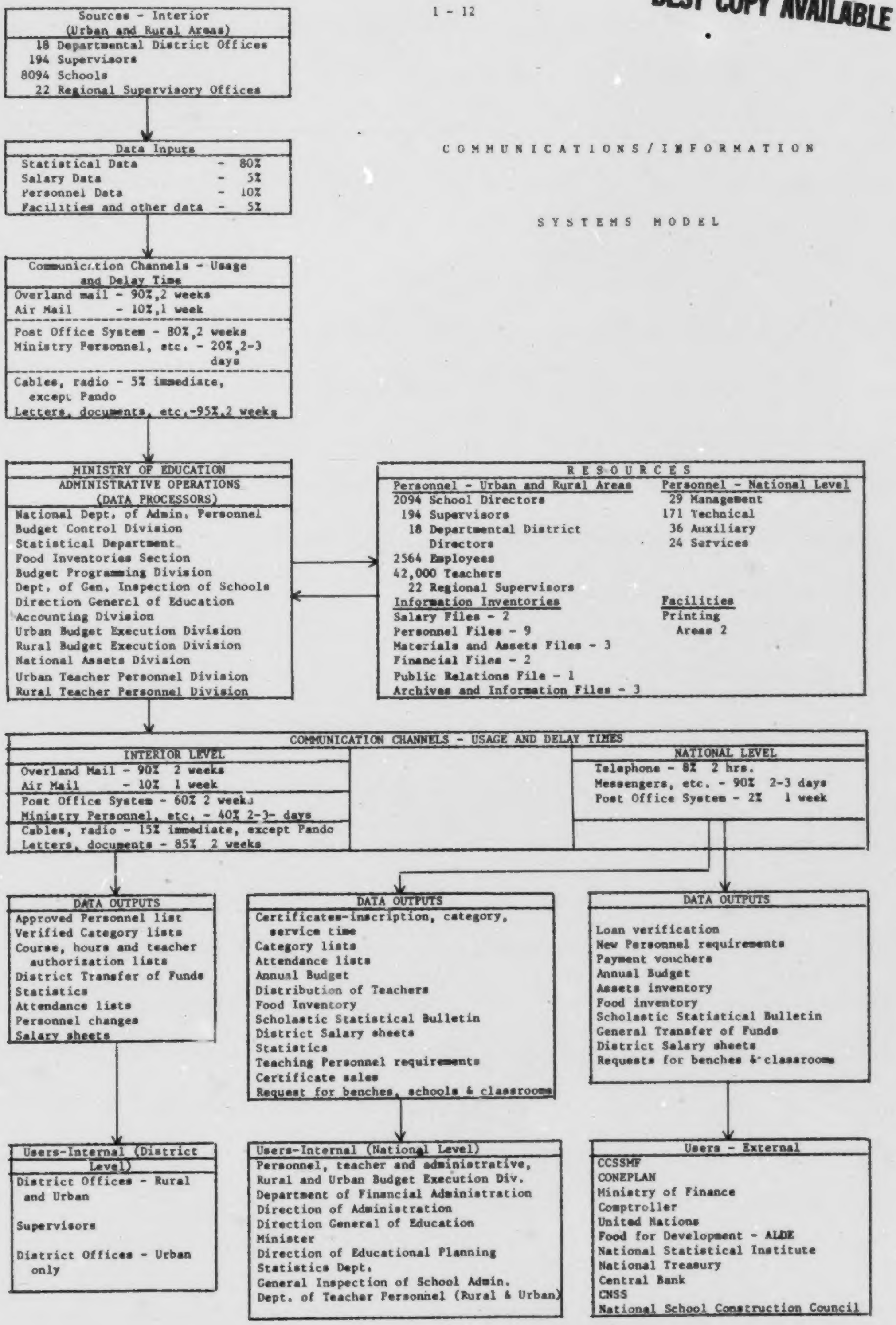
3.0 STRUCTURE

3.1 Communications/Information Systems Model

The model shows in graphic form the relationships between the data sources and inputs, the data users and outputs, the types of resources employed in processing and handling the data, and characteristics of the communications channels involved in data transmission. Each one of these areas is analyzed and evaluated in the sections that follow.

COMMUNICATIONS/INFORMATION

SYSTEMS MODEL


Sources - Interior (Urban and Rural Areas)
18 Departmental District Offices
194 Supervisors
8094 Schools
22 Regional Supervisory Offices
Data Inputs
Statistical Data - 80%
Salary Data - 5%
Personnel Data - 10%
Facilities and other data - 5%
Communication Channels - Usage and Delay Time
Overland mail - 90%,2 weeks
Air Mail - 10%,1 week
Post Office System - 80%,2 weeks
Ministry Personnel, etc. - 20%,2-3 days
Cables, radio - 5% immediate, except Pando
Letters, documents, etc.-95%,2 weeks
MINISTRY OF EDUCATION
ADMINISTRATIVE OPERATIONS (DATA PROCESSORS)
National Dept. of Admin. Personnel
Budget Control Division
Statistical Department
Food Inventories Section
Budget Programming Division
Dept. of Gen. Inspection of Schools
Direction General of Education
Accounting Division
Urban Budget Execution Division
Rural Budget Execution Division
National Assets Division
Urban Teacher Personnel Division
Rural Teacher Personnel Division
RESOURCES
Personnel - Urban and Rural Areas
2094 School Directors
194 Supervisors
18 Departmental District Directors
2564 Employees
42,000 Teachers
22 Regional Supervisors
Personnel - National Level
29 Management
171 Technical
36 Auxiliary
24 Services
Information Inventories
Salary Files - 2
Personnel Files - 9
Materials and Assets Files - 3
Financial Files - 2
Public Relations File - 1
Archives and Information Files - 3
Facilities
Printing Areas 2
COMMUNICATION CHANNELS - USAGE AND DELAY TIMES
INTERIOR LEVEL
Overland Mail - 90% 2 weeks
Air Mail - 10% 1 week
Post Office System - 60% 2 weeks
Ministry Personnel, etc. - 40% 2-3- days
Cables, radio - 15% immediate, except Pando
Letters, documents - 85% 2 weeks
NATIONAL LEVEL
Telephone - 8% 2 hrs.
Messengers, etc. - 90% 2-3 days
Post Office System - 2% 1 week
DATA OUTPUTS
Approved Personnel list
Verified Category lists
Course, hours and teacher authorization lists
District Transfer of Funds
Statistics
Attendance lists
Personnel changes
Salary sheets
DATA OUTPUTS
Certificates-inscription, category, service time
Category lists
Attendance lists
Annual Budget
Distribution of Teachers
Food Inventory
Scholastic Statistical Bulletin
District Salary sheets
Statistics
Teaching Personnel requirements
Certificate sales
Request for benches, schools & classrooms
DATA OUTPUTS
Loan verification
New Personnel requirements
Payment vouchers
Annual Budget
Assets inventory
Food inventory
Scholastic Statistical Bulletin
General Transfer of Funds
District Salary sheets
Requests for benches & classrooms
Users-Internal (District Level)
District Offices - Rural and Urban
Supervisors
District Offices - Urban only
Users-Internal (National Level)
Personnel, teacher and administrative, Rural and Urban Budget Execution Div.
Department of Financial Administration
Direction of Administration
Direction General of Education
Minister
Direction of Educational Planning
Statistics Dept.
General Inspection of School Admin.
Dept. of Teacher Personnel (Rural & Urban)
Users - External
CCSSMF
CONEPLAN
Ministry of Finance
Comptroller
United Nations
Food for Development - ALDE
National Statistical Institute
National Treasury
Central Bank
CNSS
National School Construction Council

3.2 Data Outputs and Users

The processed data outputs from the educational information systems result primarily from the administrative operations within the Ministry of Education. For purposes of this analysis, the departments which process input data through the use of files or information inventories shall be referred to as data processors. However, some departments process data without files; others have files, but do not process data. Data outputs from the files are analyzed and indicated in Section 3.4.2. The users of data outputs from the data processors are divided into three groups, as shown in Section 3.1, Communications/Information Systems Model. They are as follows:

- Internal users, at the national level (Ministry);
- Internal users, at the district level (i.e., the rural and urban districts);
- External users, (those outside the educational system and Ministry of Education);

The analysis proceeds from data processors, their data outputs (and respective users) to internal users.

3.2.1 Data Processors

The data processors are identified as personnel, budget, assets, supplies, statistics and salary.

3.2.1.1 Personnel Data Processors

The data outputs refer to teaching, administrative and Ministry personnel and are analyzed in Figure 3.2.1.1.1. For salary purposes, the Department of Teacher Personnel provides updated or corrected lists of categorized teaching and administrative personnel to the rural and urban districts, and to the Rural and Urban Budget Execution Divisions. It also provides category certification to the same personnel.

The Direction General of Education provides the approved lists of teaching and administrative personnel to all the districts, before the school year begins.

The National Department of Administrative Personnel provides monthly lists of Ministry personnel who are to be fined for lateness and absenteeism. The lists go to the Urban Budget Execution Division.

The Department of General Inspection of School Administration provides data to the urban districts only. The data consists of courses, distribution of teachers in new and existing positions, and teaching hours. None of this data is provided for the rural districts; nor is there any control between what is programmed and authorized (for personnel, courses, and hours), and what is actually being spent in monthly salaries.

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Direction General of Education, and its divisions	Statistics Teacher & Admin. personnel This data arrives in December.	Rural Districts and Urban Districts There are 44 rural and urban district offices.	Approved Personnel Lists: Teachers & Admin. district service years supervisor category province job title school title name The lists go out in Feb.	Rural Districts and Urban Districts There are 44 rural and urban district offices
Division of Urban Teacher Personnel	Inscription: Personal data Service data	Records of teacher and admin. personnel Volume: 142 records/month	Computation sheet: Personal data Service data Volume: 120 sheets/month	Teaching and Admin. personnel dossier
	Qualification and Promotion: Service data	Records of teacher and admin. personnel Volume: 298 records/month	Service Qualification: Personal data Service data Qualification of Category For all districts except La Paz Volume: 330 qualifications/month Payment for Category: Name Roster inscription date Qualified service time Category Date For La Paz only Volume: 310 payments/month during December-Sept.	Teaching and Admin. personnel dossier
	Category Verification: district years service level category name school title year	List of Categorized Teachers 22,800 persons from all the districts, except La Paz and Cochabamba. These listsare sent during April-October.	Categorized Teachers from the Interior — 15,000 persons district service time year category name title These lists go out during April - October.	Districts, Urban Budget Execution Div.

FIGURE 3.2.1.1.1 /p.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Urban Teacher Personnel	Loan Application: names - 3 persons service time-3 pers. identity card-3 pers. basic salary-3 pers. amount requested - 1 person The data is for the number of persons indicated.	Loan Application: 660/mo. CCSSMF (Teachers) complimentary social security org.)	Same as Data Input	CCSSMF
Division of Rural Teacher Personnel	Inscription: Personal data Service data	Records of teacher and Admin. personnel Volume: 129 records/month	Computation Sheet: Personal data Service data Volume: 129 sheets/month	Teacher and Admin. Personnel dossier
	Qualification and Promotion: Service data	Records of teacher and Admin. personnel Volume: 33 records/month	Category Sheet: personal data district qualified service time category date years service Volume: 33 sheets/month	Teacher and Admin. Personnel dossier
	Category verification: district job title year years serv. name category title	Personnel Lists: Teacher, admin. & service personnel From all districts; 12,931 persons. Sent during the months of June-September.	Lists of Categorized Personnel: Teachers and Admin. district title year years service name category job title 12,324 persons Sent out during the months of June - September.	Districts, Rural Budget Execution Dept.
	Loan Application: name - 3 persons service time-3pers. identity card-3 pers. basic salary-3 pers.	Loan Application: CCSSMF (Teachers) complimentary social security)	Same as Data Input	CCSSMF

FIGURE 3.2.1.1.1 /p.2

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Teacher Personnel	Amt. requested-1 person The date is for the number of persons indicated.	Volume: Nov.- March & June: 770/month other months: 5/mo.		
National Department of Administrative Personnel	Daily Personnel Attendance Sheets: name latenesses absences abandonments	Eight buildings of the Ministry of Education	Monthly Report of Fines and Penalties of Ministry Personnel: name latenesses absences abandonments Volume: 300 cases per month	Urban Budget Execution Div.
Department of General Inspection of School Admin.	Data of promoted students and in-attendance students by schools levels districts urban area	Districts (9) Regional offices(13) For urban area	Authorization for grades by districts schools levels urban area Sent during the months of January - February.	Districts (9) Regional Offices (13) For urban area
	Data of teachers job titles grades by schools levels districts urban area	Same as above	Regulation of items of teacher personnel admin. personnel service personnel by district level subject school urban area Sent out during months of March and April.	Same as above
	Applications for new positions by schools levels districts subjects (see next page)	Same as above	Overall Chart of New Positions of teacher and admin. personnel by districts levels urban area Distribution of New Positions (see next page)	Minister of Education CONEPLAN (Min. of Planning) Ministry of Finance Districts (9)

FIGURE 3.2.1.1.1 /p.3

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Department of General Inspection fo School Admin.	of teacher & admin. personnel in the urban area.		of teacher and admin. personnel by districts grades levels hours schools Sent out during the months of May and June.	
	Data of Fund Transfers From the previous year by districts items	Same as above	Authorization of Hours* of teacher personnel by districts levels schools grades subject *This authorization is the result of all the data inputs. Sent out during the months of January and February,	Same as above

FIGURE 3.2.1.1.1/p.4

3.2.1.2 Budget Data Processors

The data outputs are related to the national educational budget and to the expenditures against it. The Budget Programming Division prepares the annual educational budget and a personnel distribution list at the national level.

The Accounting and Budget Control Divisions prepare payment vouchers for services and goods. Approximately 95% of the vouchers go to the Ministry of Finance for execution and payment. The remainder is paid by the Accounting Division. These two divisions do not perform any budget or expenditure control; rather, this function is handled mainly by the Ministry of Finance and -- to some degree -- by the Department of Financial Administration. The data analysis is in Figure 3.2.1.2.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Budget Control Div.	Notes for payment of Salaries: name amount date This is for personnel whose salaries were not processed by CENACO, because of errors or omissions. Volume 1973: 2500 notes	Urban Budget Execution Division	Payment Voucher for salaries name voucher N° date account code description amount Volume 1973: 1294 vouchers	Ministry of Finance
	Invoices: date item origin description amount quantity Volume: 20-30/month	Interested Parties, Department of Financial Admin., Min. of Education.	Payment Voucher for goods and service: data is same as above Volume 1973: 479 vouchers	
Budget Programming Division	Personnel Lists: teacher administrative service Lists of schools	District offices, Regional & zonal supervisory offices	Annual Ministry of Education Budget	Department of Financial Admin., Direction of Admin., Ministry of Finance
	Salary sheets of admin. personnel from district offices regional & zonal supervisory offices	Same as above		
	Salary Sheets of Ministry of Education Personnel	Urban Budget Execution Division	Item distribution chart for national level: item N° service time name job title district level category	Direction of Admin. Direction General of Educatio
	Expenditure lists: account number amounts	Accounting Division		
	Expenditure lists: account number amounts	Budget Control Div.		

FIGURE 3.2.1.2.1 /p.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Accounting Div.	Invoices: 20/week quantity date item origen value	Commercial firms	Receipt: value description date Petty cash list: monthly item quantity value date	Commercial Firms, Department of Financial Admin.
	Rotating Funds Payment Order: 40-45/month description value date destination	Department of Financial Admin.	Check: date account N° account name value interested party	Interested Party
			Expenditure list: End of year accounts amounts	Budget Programming Division
	Budget Accounts Payment Order: 25/month description value date interested party	Department of Financial Admin.	Expenditure Voucher: bank account N° account N° account name description value date interested party	Ministry of Finance

FIGURE 3.2.1.2.1/p.2

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3.2.1.3 Assets Data Processor

The data is mainly a verification of assets inventories in schools and offices of the Ministry. The verification and inventory lists go to the national Comptroller. The analysis is in Figure 3.2.1.3.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Assets Division	Inventory Record of Schools Ministry offices item quantity value	Districts - interior Schools - La Paz Offices - Ministry	Inventory Verification: school office address quantity description supplier receipt N° amount	Comptroller

FIGURE 3.2.1.3.1

3.2.1.4 Supplies Data Processor

The supplies refer to food supplies which are donated and distributed to 14 rural normal schools and 2 urban institutes. The analysis is in Figure 3.2.1.4.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
PMA-065 *	Monthly reports on nine food types: balance-on-hand consumption receipts	14 rural normal schools 2 institutes	Quarterly, semester, and annual reports of: food receipts in central warehouse delivery to schools consumption in schools balance-on-hand in schools	ALDE - Food for Growth United Nations Minister of Education

* Code number of educational food program, given by ALDE (Alimentos para Desarrollo, or Food for Growth).

FIGURE 3.2.1.4.1

3.2.1.5 Statistics Data Processor

The data output is a bulletin of scholastic statistics, which is distributed in the Ministry and the National Institute of Statistics. The last published issue was for 1971, due to the inherent time delay built-in to the data collection system of the Statistical Department (which is part of the Direction of Educational Planning). The same department also issues data on teaching and administrative personnel requirements. The analysis is in Figure 3.2.1.5.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Statistical Dept.	Student Enrollment by age sex grade level Personnel lists: teachers admin. Arrives 6 mos. after close of school year.	Districts, rural & urban Public & private sectors Regional & zonal supervisory offices COMIBOL (Nationalized mining Co.) YPFB (National Oil Co.)	Bulletin of Scholastic Statistics - 1971 Preliminary data on years following 1971	Direction of Educational Planning National Institute of Statistics Direction General of Education Others not identified
	Preliminary data from secondary level on students enrolled in-attendance passed failed Data is from end of school year, before compensatory exams. Arrives 1 year after close of school year.	Same as above		
	Final data from primary, intermediate and secondary levels on students enrolled in-attendance qualified passed on personnel teachers admin. Data is from end of school year, after compensatory exams. Arrives 1-1/2 years after close of school year.	Same as above		

FIGURE 3.2.1.5.1. /p.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Statistical Dept.	Data on normal school graduates Data on enrolled students and personnel--teacher and admin.	Same as previous page	Lists of needs for personnel--teacher and admin. Lists of needs for student report cards	Direction General of Education Direction of Educational Planning
	Statistical Tables of Adult Education and Literacy on students districts personnel grades centers Arrives 6 mos. after close of school year.	National Direction of Literacy and Adult Education	Bulletin of Scholastic Statistics, 1971 Preliminary data on years following 1971	Direction of Educational Planning National Institute of Statistics Direction General of Education Others not identified

FIGURE 3.2.1.5.1/p.2

3.2.1.6 Salary Data Processor

The data outputs are the same from the Rural and Urban Budget Execution Divisions. The outputs are divided into two types, one of which goes to the National Computing Center (CENACO) for processing of salary sheets. The salary sheets are for the urban and rural teaching and administrative personnel of the La Paz district. The Ministry personnel data sheets are processed by CENACO along with the urban personnel.

The second output consists of a Transfer of Funds for the interior urban and rural districts, based on their salary lists and categorized personnel lists. In addition, the Urban Budget Execution Division uses scholarship, hours and personnel items to prepare the Transfer of Funds for the urban districts. The analysis is in Figure 3.2.1.6.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Budget Execution	Attendance Report: date school zonal supervisor name school or job title days worked origin Reports arrive on the Fifth of the month.	Zonal supervisors of the La Paz District	Modification List: vacated item N° identity N° employed item N° identity Nº name % category days worked basic salary bonuses and amounts Active or Passive Beneficiaries: insured employee item N° identity N° name social security N° beneficiary birthdate benefit code amount name Income Tax Return: name salary item N° tax due Modifications of identify N° name tax	CENACO (National Computation Center)
	Assignment Memo: Monthly date school zonal supervisor school or job title name	Same as above		
	Authorization or Cessation of dependents' allowance pay: insured employee item N° identity number name social security N° beneficiary birthdate name benefit code Arrives monthly.	CNSS (Social Security Agency)		
	Category list: La Paz year years serv. job title name title category For 3,588 persons. Arrives in August.	Div. of Rural Teacher Personnel		

FIGURE 3.2.1.6.1 /p.1

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Budget Execution	Income Tax Return: Monthly name salary item N° tax due For personnel: Teacher, Admin. and service	Income Tax Agency	Same as preceding page.	CENACO
	Salary sheets from the Interior: name personal identification school identification income items deduction items net due	District offices-9 Regional & zonal supervisory offices - 13 Sent every month. The very remote & distant locations send 1 or 2 times/ year.	Summary of Transfer of Funds: districts basic salaries categories functional bonus border and region food assignment compensation bonus dependent's allowance home subsidy total	Ministry of Finance, Comptroller, National Treasury, Central Bank
	Categorized Lists from the interior: 22 locations district title year category name job title Lists cover 8,736 persons.	Division of Rural Teacher Personnel Sent during June-September.	It is also distributed by accounts of the ordinary budget, as follows: 100 Personal Services 110 Permanet Employees 111 Basic Salaries 112 Categories 113 Bonuses 116 Dependents' Allowance 118 Home subsidy Transfer of Fund Total	
			Transfer of Funds Detail, by district: description of items transfer of funds (current month.) refunds (previous month) total transfer of funds Total	Districts (22), Comptroller

FIGURE 3.2.1.6.1 /p.2

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Budget Execution			The items are: basic salaries categories functional bonus food assignment compensation bonus dependents' allowance home subsidy	Districts (22), Comptroller
Division of Urban Budget Execution	Attendance Report; fifth day of every mo.	La Paz district--city & provinces	Active or Passive Employees: vacated item N° identity N° employed school code item N° identity N° name job code % category days/hrs worked basic salary bonuses and amounts Active or Passive Beneficiaries: insured employee item N° identity N° name social security N° beneficiary birthdate benefit code amount name Income Tax Return: name salary item N° tax due	CENACO (National Computation Center)
	Assignment Memo; monthly	Same as above		
	Authorization or Cessation of Dependents' allowance pay; monthly	CNSS (Social Security Agency)		
	La Paz District Category List; arrives in August.	Div. of Urban Teacher Personnel		
	Income Tax return; monthly The data in each input is the same as for the Div. of Rural Budget Execution. All the above is for personnel: teacher admin. services	Income Tax Agency		

FIGURE 3.2.1.6.1 /p.3

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Urban Budget Execution	Monthly report of Fines and Penalties: 300 persons per mo. name latenesses absences/abandonments	National Department of Administrative Personnel	Modification of identity N° name tax	
	Authorization or Cessation of Dependents' allowance pay; monthly	CNSS		CENACO
	Income Tax Return: monthly All the above is for Ministry personnel.	Income Tax Agency		
	Scholarship List: name amount expiration date district of location	Scholarship Dept.	Summary of Transfer of Funds	Ministry of Finance, Comptroller, National Treasury, Central Bank
	1000 persons/year La Paz - 60% Sucre & Santa Cruz 40%		Transfer of Funds by district, for 22 districts	
	Authorization of hours and items by district (22 districts): district N° & name of school locality level grades hours items	Dept. of General Inspection of School Admin.	For data in above, see Rural Budget Execution Dept.	22 districts Comptroller

FIGURE 3.2.1.6.1 /p.4

DATA PROCESSOR	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Urban Budget Execution	Salary Sheets from Interior: name personal identification school identification income items deducation items net due	22 interior districts; sent every month.		
	Category lists from Interior-22 districts district year name title service time category Arrive during April - October.	Urban Div. of Teacher Personnel	Same as preceding page.	22 districts, comptroller

FIGURE 3.2.1.6.1 /p.5

3.2.2 Internal Users

The internal users utilize data to perform operations which result in the flow of goods/materials or generate internal actions.

From the analysis, the following conditions or situations are noted:

- Purchase of materials and supplies is performed by both the Purchases/Supplies Division and the Department of Financial Administration. Purchasing is also realized by other offices.
- Several departments have established their own data channels to the interior districts for the data they use. They do not rely on the data published by the Statistical Department.
- The departments within the Direction of Educational Planning are highly independent and uncoordinated in their activities.
- The two printing facilities are independent of each other and contain identical equipment, all of which is highly underused.
- Internal Auditing is mainly performed in the school establishments of La Paz. The technique employed is rendering of accounts.
- Production, purchasing and distribution of didactic materials is handled by a wide variety of offices and departments within and outside of the Ministry of Education.

The analysis is in Figure 3.2.2.1.

INTERNAL USER	PRESENT DATA USED	DATA SOURCE	REQUIRED DATA	PURPOSE OF DATA
Dept. of Internal Audit	Economic, accounting and financial data	Schools and Ministry offices	None indicated	Internal audit and job control.
Div. of Purchases and Supplies	Materials Requests: place item date quantity office description	Ministry offices and depts.	None indicated	Distribute from stock office supplies cleaning supplies sanitary supplies
	Balance-on-hand: quantity item Materials Requests: same as above	Warehouse: Supplies Inventory File Ministry offices & depts. Minister	None indicated	Purchase of supplies: office cleaning sanitary patriotic and small normal items.
Dept. of Financial Administration	Item Requests: place quantity date item office description	Minister, Direction of Rural Educ. (has independence in materials purchasing), Other offices	None indicated	Purchase of large and special items.
National Direction of Curriculum	Data on national survey on social studies	Districts: supervisors teachers	None indicated	Readjustment of Social Studies Programs.
	Number of teachers by level (This is late, incomplete & inaccurate.), Number of students	Statistical Dept.	Number of teachers by subject grade level (Also from COMIBOL and YPFB), Occupational demand, Technical resources of schools	Program planning and preparation.

FIGURE 3.2.2.1 /p.1

INTERNAL USER	PRESENT DATA USED	DATA SOURCE	REQUIRED DATA	PURPOSE OF DATA
Assets Div.	Inventory of items acquired during the school year in terms of: quantity name value The items are: furniture scholastic material office equipment clothes tools others Also, property assets are indicated: location school owned or rented These arrive in November .	Districts, Schools, Ministry offices	None indicated	Maintain an updated assets file. Verify the acquisition of items by school. This is done only in La Paz, and then only partially.
PMA-065* *: Code number of educational food program, given by ALDE (Food for Growth).	Data of Beneficiaries: N° teacher personnel N° Admin. personnel N° students 5,418 persons from 14 rural normal schools and 2 institutes	National Direction of Normal Schools Statistical Dept. (The data sent is not used, because it is incomplete and incorrect.)	None indicated	For the distribution of donated food to rural normal schools and institutes.
Departments within the Direction of Educational Planning: Economic Analysis and Programming Dept.	Ministry of Education Budgets, 1967-71; Diagnostic.	Div. of Budget Programming Direction of Educational Planning.	Educational costs by levels, Personnel salaries, Classroom data	Economic, social and other requirements, studies and analyses.

FIGURE 3.2.2.1 /p.2

INTERNAL USER	PRESENT DATA USED	DATA SOURCE	REQUIRED DATA	PURPOSE OF DATA
Educational Programming and Investigation Dept.	Diagnostico	Direction of Educational Planning	Supervision, Programs, Hours.	Studies and analysis, Bolivian Plan for Educational Development.
Educational Technology Dept.	It is being organized; presently, it has no specific activities, aside from participating in the preparation of the Bolivian Plan for Educational Development.	None indicated	None indicated	None indicated
General Secretary Dept.	General Correspondence	Ministry offices	None indicated	Take the corresponding action and file.
Administrative Dept.	Requests for typing services	Other depts. in Educational Planning.	None indicated	Work to be typed by secretary pool
Coordinator	None	None	None indicated	None
Publication Dept.	Verbal work orders: type volume	Director of Educational Planning	None indicated	Perform printing jobs
Special Projects Depts.	It is being organized	Did not know	None indicated	None indicated
Scholastic Warehouse	Name of schools in La Paz district, Number of schools by level in interior Data from schools in La Paz and interior: name number of grades (by level and total) number of students	Statistical Dept. (The data is incomplete and incorrect.) Schools	None indicated	Distribution of chalk to schools.
	Number of teachers and students, by district	Districts, Statistical Dept.	None indicated	Distribution of texts, guides, and programs.

FIGURE 3.2.2.1 /p.3

INTERNAL USER	PRESENT DATA USED	DATA SOURCE	REQUIRED DATA	PURPOSE OF DATA
Scholastic Technical Support Dept. (SATE)	Work orders: printing 15/mo. multicopies 10/mo.	Minister of Education, Subsecretaries, Culture, Schools in La Paz, FSB, Ministry offices & depts.	None Indicated	Perform printing jobs.
Direction of Information, Public Relations And Press	Newspaper articles on Education: direct indirect	Newspapers of La Paz Oruro Cochabamba Santa Cruz others	None Indicated	Daily summary for Minister and inquiries.

FIGURE 3.2.2.1 /p.4

3.3 Data Inputs and Sources

The data input to the educational information systems comes primarily from the urban and rural districts of the interior. The total number of districts which provides data to the national level is 44. The departmental urban and rural districts number 18 -- i.e., two districts, urban and rural, for each of 9 departments. Each of the two districts has the same name (e.g., Oruro). There are 14 regional and 12 zonal supervisory districts in the rural and urban areas. Of these, 18 are equally divided in urban and rural districts with the same name (e.g., Tupiza) . The remaining 8 -- of which 4 are urban districts and 4 rural -- all have different names.

Depending on the use of data input and convenience, some national level departments group the regional and zonal districts in different ways, creating confusion in their data input and output, and requiring reclassification by the user. As a result, some users have created new data channels to the sources, for their own purposes.

To facilitate the analysis of the data input, it has been classified according to the type of data. The classification is as follows: Statistical data, salary data, personnel data, and facilities and other data.

3.3.1 Statistical Data

This type of data represents, in all its forms, approximately 80% of the data input to the present information systems. The data originates at the school level, then goes to the supervisory and district level, and ends at the national level. The analysis of this data is provided in Figure 3.3.1.1.

SOURCE	PRESENT DATA	USER	REFERENCE
Rural School	Student Statistical Report - Monthly monthly year school teacher grades enrollment in-attendance work days Teacher Attendance & Performance - Dec. zone locality school name title category job title grade passed students teacher evaluation years service Statistics Teaching & Admin. Personnel-March district province locality school level shift name identity N° sex age marital status service time category title job title grade subject hours Inventory - Dec. furniture library scholastic material school quantity description unit value total value state material	Rural Supervisor	Statistical Data from Rural Schools
	Statistic - Students March, July, December school level locality province district age enrolled in-attendance passed grade sex classrooms withdrawals failed zone -March -July -Dec. Final Grades December district levels school grades year students'name year lost compensatory exam Attendance Report- Tearcher & Admin. Personnel-Monthly name marital status assigment school job title title years service category date days worked identity N°	Rural District	

FIGURE 3.3.1.1 /p.1

SOURCE	PRESENT DATA	USER	REFERENCE
Urban School	• Statistics - March Student Enrollment district province school level grades students sex age Teacher & Admin. Personnel district province locality school level shift name identity N° age sex marital status service item category title job title grade subject hours	Urban District	Statistical data from Urban School
	Statistics - December Student zone level school locality grades enrolled withdrawals in-attendance failed passed classrooms Teacher Attendance and Performance zone locality school name title years service category job title grade absences students passed teacher evaluation Inventory furniture library scholastic material school year quantity description state unit value total value	Urban Supervisor	
	Final Grade-Dec. district level school grades year student name subjects compensatory exam year lost Attendance Reports-Monthly Teacher and Admin. Personnel name marital status date assigned school job title title category days worked identity N°	Urban District	

FIGURE 3.3.1.1. /p.2

SOURCE	PRESENT DATA	USER	REFERENCE
Urban Supervisor and Rural Supervisor	Statistical Charts - December Personnel: school, title, teaching admin. service, capital, provinces, private, job title, category, no category Students: school, grades, enrolled, withdrawals, in-attendance, passed, failed, capital, provinces, private School Premises: school, ownership, classrooms, condition, shift, address, type, capital, provinces, private Furniture: school, benches, chairs, tables, blackboards, condition, city, province Inventory: furniture, library, scholastic material, school, year, quantity, description, condition, unit value, total value	Urban District Rural District	Statistical dat from supervisors
	Statistics - December Teacher Performance: school, locality, students passed, general average Students: zone, level, grade, classes, sex, enrolled, withdrawal, in-attendance, failed, passed Summary of Existing Positions: school, locality, directors, preceptors, teachers, music, physical ed., manual arts, secretaries, janitors, total Schools: level, school, locality, number, ownership, shift, N° usable classrooms, N° unusable classrooms Summary Personnel Teachers and Admin.: zone, level, grade, sex, urban normal, rural normal, titled by seniority, provisional, secretaries, nurse maids, janitors, servants, directors School Premises: level, school, locality, existing benches, existing tables, existing blackboards, required blackboards, required benches Scholastic Evaluation: zone, year, school, number grades/classes, sex/grades (1-6), enrolled, withdrawn, in-attendance, failed, passed	Direction General of Education, Supervisor General of Education, National Director of Primary Education, Urban district, Rural district	

FIGURE 3.3.1.1 /p.3

SOURCE	PRESENT DATA	USER	REFERENCE
Urban Supervisor and Rural Supervisor	Statistical Charts - December Students school enrolled in-attendance passed failed age level locality zone grade classes Grades/Classes school Creation of New Positions school locality Personnel teachers admin. category title sex level item N° identity N° name job title years service School Premises zone projected N° classrooms N° schools Schools classrooms conditions locality ownership Student Promotion school level grade student name grade avg.	Direction General of Education Urban District Rural District	Statistical Data from supervisors
Urban Supervisor of Literacy and Adult Education	Statistical Data from CEMA, EBA, IBA*, Night Schools and Literacy Schools school subjects levels enrolled withdrew effective passed failed *CEMA - Center of Secondary Education EBA - Accelerated Primary Education IBA - Bolivian Institute of Apprenticeship	Direction General of Education National Direction of Night Schools and Literacy National Direction of CEMA National Direction of EBA National Direction of IBA	Statistical Data from Supervisors
Urban District	Centralized Statistics from the District Students - March & July school level grades sex enrolled withdrew in-attendance Students - March ages levels Material and Furniture-November Students-January compensatory exam Personnel - July teachers admin. Students-December. enrolled passed	Direction General of Education Statistical Dept. (only students & personnel data) Dept. of General Inspection of School Admin.	Statistical Data from the Urban District

FIGURE 3.3.1.1 /p.4

SOURCE	PRESENT DATA	USER	REFERENCE
Urban District	Centralized Statistical Data - December* Students in Capital and Provinces (Public & Private) N° schools enrolled in-attendance passed failed passed 2nd. exam (habilitado) *This statistical data is the same for the rural district.	Same as preceding page	Statistical Data from Urban District
Rural District	Centralized Statistics from the District-March, July & Dec. Student Promotion - Dec. only levels zones grades sex district normal schools institutes enrolled in-attendance failed passed withdrawals passed 2nd. exam Personnel teacher admin. levels zone sex service time title job title school subject category no category district normal schools institutes Schools zones central sectional private district public Students literacy centers Students schools levels zones grades sex districts compensatory exam enrolled withdrawal in-attendance pre-exam passed failed Inventories - Dec. only zones description condition unit value total value district normal schools institutes levels Schools Premises zones schools N° classrooms N° schools teachers' housing constructed projected sports areas school orchards cultivated land: hectares district	Direction General of Education; Natinnal Direction, Rural Education; National Direction, Rural Primary Education; National Supervisor, Primary Education; National Education Inspector; National Office of Normal Schools; Statistical Dept. (Students & personnel)	Statistical Data from the Rural District

FIGURE 3.3.1.1 /p.5

Most of this data, which is somewhat accurate, timely (3 months late), and very repetitious, goes to the Direction General of Education and its various offices. The data is partially used and filed away. It is not distributed to any other departments or offices at the national level.

As a consequence of the above situation, other departments have established separate data channels to the districts to obtain data. Most notable among these is the Statistical Department in the Direction of Educational Planning. The data it receives is limited to that which pertains to personnel and students. However, the data is less accurate than that which is received by the Direction General of Education, and it usually arrives late -- from 6 months to 1 1/2 years after closing of a given school year. Another department which has its own data channels is the General Inspection of School Administration, which only receives data from the urban districts. This aspect was discussed in section 3.2.1.1 of Data Output and Users.

The statistical data -- as it progresses through the district levels -- bypasses the supervisory level in some cases, and the district office level in other cases, to reach the national level. This is one of the causes for data repetition. In some instances, personnel at the supervisory level act independently of the district office. As opposed to the urban district offices, the rural district offices do not allow the supervisory level to send statistical data independently to the national level.

3.3.2 Salary Data

This type of data represents approximately 5% of the data input to the present information systems. It is related to the payment of salaries to teacher and administrative personnel in the rural and urban districts. In all the districts, the monthly salary sheets are manually prepared, except for the urban district of Cochabamba and the rural/urban districts of La Paz, where CENACO prepares them on its computers. The analysis of this data is given in Figure 3.3.2.1 and is separated into rural and urban, as there are differences as to who prepares the salary sheets. In the rural areas, the district office prepares all salary sheets (for the schools and the district office). In the urban areas, the district offices prepare their own and those for some urban schools; the remaining schools prepare their own or have independent persons prepare them, as is the case in the urban district of Santa Cruz (See Appendix 6.2: Memorandum, From: Max Mehlis Garret; To Raul E. Onoro Amador; Date: February 28, 1974; Subject: Salary Preparation and Payment Procedures Employed in the Urban District of Santa Cruz). Copies of the salary sheets are sent monthly to the Divisions of Rural and Urban Budget Execution, at the national level. In very distant districts, the salary sheets arrive once or twice a year.

SOURCE	PRESENT DATA	USER	REFE
Urban Teacher and Admin. Personnel	Memorandum and Record of Taking Office	Urban District	Urban Dis r Salaries
Urban School	Personnel Attendance Report - Monthly Teachers and Admin. Personnel month years service social security N° year category item N° name attendance school job title identity N° title	Urban District, Independent Paymaster	
Urban School Independent Paymaster	Salary Sheet - Monthly school identification hours/day worked personal identification income items name deduction items job title net payable	Urban District	
Urban Teacher and Admin. Personnel	Category Rating personal data service data category	Urban District, Urban Schools	
Urban Supervisor	Transfers and Changes, Teacher & Admin. Personnel - Monthly for new personnel identity N° basic salary inter-school transfers item N° category vacated, retired & deceased school % category month bonuses other transfers year previous item N° job title workdays or hours	Urban District, Urban Schools, Independent Paymasters	
CNSS (Social Security Agency)	Authorization for Payment of Dependents' Allowance - Monthly insured employee child's name date benefit started social security N° birthdate marriage school benefit class family school N° expiration date infant	Urban District, Urban Schools, Independent Paymasters	

FIGURE 3.3.2.1/p.1

SOURCE	PRESENT DATA	USER	REFERENCE
CNSS (Social Security Agency)	Active and Non-Active Subsidies - Monthly item N° identity N° beneficiary date birthdate (benef.) type subsidy expiration date amount insured name social security N°	Urban District Urban Schools, Independent Paymaster	Urban District Salaries
CCSSMF (teachers' complementary social security agency)	Expenditure Voucher, Loans - Monthly name school time limit monthly payment starting month loan amount regional agency interest	Urban District, Urban Schools, Independent Paymasters	
Urban District, Urban Schools, Independent Paymasters	Salary Sheet - Monthly by school and district office name personal identification school identification job title or title days/hours worked income items deduction items net payable	Urban Supervisor, CCSSMF, CNSS, Comptroller, Sub-treasury	
Urban District, Urban Schools, Independent Paymasters	Payment Voucher - Monthly by school and person name school net payable deduction items amount due	Teacher and Admin. Personnel	
Urban District	Salary Sheet - Monthly same as above	Urban Budget Execution Div.	

FIGURE 3.3.2.1 /p.2

SOURCE	PRESENT DATA	USER	REFER
Rural Teacher and Admin. Personnel	Memorandum and Record of Taking Office	Rural District	Rural Dis Salaries
Rural Schools	Personnel Attendance, Teachers & Admin. Personnel - Monthly school job title month title year years service name category days worked attendance absences identity N°	Rural District	
Rural Teacher and Admin. Personnel	Category Rating personal data service data category	Rural District	
Rural Supervisor	Transfers and Changes, Teaching & Admin. Personnel - Monthly same data as urban	Rural District	
CNSS (Social Security Agency)	Authorization for Payment of Dependents' Allowance - Monthly same data as urban -- Active and Non-Active Subsidies - Monthly same data as urban	Rural District	
CCSSMF (Teachers' complimentary social security agency)	Expenditure Voucher, Loans - Monthly same data as urban	Rural District	
CONAVI (National Housing Council)	Discount Lists - Monthly name starting month school loan amount monthly payment regional agency	Rural District	

FIGURE 3.3.2.1 /p.3

SOURCE	PRESENT DATA	USER	REFERENCE
Rural District	Salary Sheet - Monthly by school and district office same data as urban	Rural Supervisor CCSSMF, CNSS, Comptroller, Sub-treasury	Rural District Salaries
	Payment List - Monthly by school and district office name school month year job title net payable	Comptroller,	
	Payment Voucher - ~~Monthly~~ by school and person same data as urban	Rural Teacher and Admin. Personnel	
	Salary Sheet - Monthly same as above	Rural Budget Execution Div.	

FIGURE 3.3.2.1/p.4

3.3.3 Personnel Data

This type of data represents approximately 10% of the data input to the information systems. It is related to teacher and administrative personnel requirements and categorization.

The categorization data goes to the Rural and Urban Registry Divisions of the Department of Teacher Personnel, for verification in the national rosters.

The personnel requirements data goes to the Direction General of Education and the Department of General Inspection of School Administration, where it is modified and approved for the new school year. However, these departments act independently. The analysis of this data is in Figure 3.3.3.1.

SOURCE	PRESENT DATA	USER	REFERENCE
Rural District and Urban District	Categorization List - June-Sept. (Rural) April - Oct. (Urban) Teacher and Admin. Personnel district Name supervisor job title province title school years service category	Div. of Rural Teacher Personnel Div. or Urban Teacher Personnel Direction General of Education	Personnel Data
Urban Supervisor	Retirement List - Dec. teacher and admin. personnel	Urban District	
Urban District and Rural	Summary of New Position Items - Dec. Teacher and Admin. Personnel school teachers locality music directors physical ed. preceptors manual arts teachers secretaries janitors	Direction General of Education General Supervisor of Education National Direction of Primary Educ. National Direction of Secondary Level Dept. of General Inspection of School Admin. (Urban)	

FIGURE 3.3.3.1

3.3.4 Facilities and Other Data

These types of data represent approximately 5% of the total input to the information systems. The facilities data is related to requests for school benches and classrooms. This data goes to the Direction General of Education and the local regional office of the National School Construction Council. They are supposed to coordinate and provide benches and classrooms on a priority basis.

The other data relates to the sale of educational certificates and forms. The sales information is sent to the Department of Financial Administration at the national level. There, funds are used by the Accounting Division to cover some expense items not included in the national budget. The analysis of this data is in Figure 3.3.4.1.

SOURCE	PRESENT DATA	USER	REFERENCE
Urban Schools and Rural Schools	Requests for benches and school premises	Urban District and Rural District	Furniture and school premises requirements.
Urban Supervisor and Rural Supervisor	List of schools present required	Urban District and Rural District	
Urban District and Rural District	Request for benches and school premises	Direction General of Education CONES (National Council of School Buildings)	
Urban District	Sales Reports Certificates	Deparment of Financial Admin.	

FIGURE 3.3.4.1

3.4 Resources

The resources within the Bolivian educational system and the Ministry of Education are classified and evaluated as they affect the current communications/information systems. Resources are classified in personnel, information inventories and facilities.

3.4.1 Personnel

Personnel are further subdivided into those in the districts, (urban and rural areas) and those in the administrative areas, departments and offices at the national level (Ministry of Education).

3.4.1.1 Districts - Urban and Rural Areas

The numbers and types of personnel in the districts are as follows:

2,094	school directors*
194	supervisors
18	departmental district directors
22	regional supervisors
42,000	teachers
2,564	administrative and service employees

Most of the personnel are involved in some data-gathering functions. This is not very well organized, and -- above all -- a great deal of it is repetitious and duplicated.

*This figure does not include thedirectors of rural literacy schools, because they are not paid by the educational system. Generally, none of these figures are totally reliable, as they were obtained from the National Statistics Department.

3.4.1.2 Ministry of Education

The numbers and types of personnel in the Ministry are indicated in Figure 3.4.1.2.1, by the administrative areas covered in this study. (Obviously, the figure does not include all of the personnel of the Ministry.)

Some of the personnel -- about 18 persons -- are involved in data-gathering functions. Approximately 74 additional persons process data in five of the listed offices.

Administrative Offices	Total	Super-visory	Technical	Clerical or Auxiliary	Service
Direction of Administration	9	1	2	4	2
Dept. Scholastic Technical Support	23	1	20	1	1
Dept. Administrative Personnel	21	3	12	4	2
Dept. Financial Administation	50	6	32	7	5
Dept. Teacher Personnel	21	3	15	2	1
Dept. Purchases, Supplies, Assets	14	4	2	3	5
Dept. Archives & Information	8	2	3	2	1
Direction of Educational Planning & Offices	57	10	37	6	4
Dept. Public Relations	6	1	3	1	1
Internal Audit Office	5	1	3	1	-
National Direction of Curriculum	42	4	33	4	1
TOTALS:	256	36	162	35	23

FIGURE 3.4.1.2.1

3.4.2 Information Inventories

The information inventories in the existing educational information system are all located in the Ministry of Education. There are a total of 20 files in six administrative offices. Here, they are classified according to their use and are briefly described, with a detailed analysis included for each file.

3.4.2.1 Salary Files - 2

These two separate files are used for producing the monthly salary lists for personnel in the rural and urban districts of La Paz. The urban file is also used for personnel in the Ministry. These files are on magnetic tape and processed by the National Computing Center (CENACO). The file analyses are in Figures 3.4.2.1.1 and 3.4.2.1.2. Of all the files in the Ministry of Education, only these two are processed and updated by computers.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Urban Budget Execution	Salary File of Personnel La paz urban district - 8,370 pers. teacher personnel admin. personnel service personnel Ministry personnel - 630 persons Contains personnel name & identification income and bonus items deduction items For the district of La Paz, city & provinces, urban area. The file is mechanized and physically located in CENACO.	Active or Vacating Employees vacating item N° identity N° active school code item N° identity N° name job code % category day/hrs.worked basic salary bonuees	La Paz District National Dept. of Admin. Personnel Div. of Urban Teacher Personnel	Salary Sheets name item N° identity N° social security N° income items deduction items net payable	Ministry of Finance, Comptroller, National Treasury
		Active or Terminating Beneficiaries insured employee item N° identity N° name social security beneficiary birthdate benefit code amount name	CNSS (Social Security Agency)	Payment Slips name identity N° item N° income items legal deductions net payable	Ministry of Finance, Central Bank Personnel teacher admin. service Min. Education
		Income Tax Return name salary item N° tax due	Income Tax Agency		
		Modification of identity N° name tax The above is sent to CENACO on the 10th of each month.	Income Tax Agency		

FIGURE 3.4.2.1.1

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Div. of Rural Budget Execution	Salary File of Personnel Teacher Personnel-3,430 persons Admin. & Service Personnel - 158 persons Contains personnel name and identification income and bonus items deduction items For the district of La Paz rural area and 158 schools. The file is mechanized & physically located in CENACO.	Modification List vacating employee item N° identity N° active employees item N° identity N° name % category days worked basic salary bonuses	Zone supervisors of the La Paz district Division of Rural Teacher Personnel	Salary Sheets name item N° identity N° social security N° income items deduction items	Ministry of Finan Comptroller, National Treasury
		Active or Terminating Beneficiaries insured employee item N° identity N° name social security beneficiary birthdate benefit amount name	CNSS (Social Security Agency)	Payment Slips name identity N° item N° income items legal deductions net payable	Ministry of Finance, Central Bank, Personnel teacher admin. service
		Income Tax Return name salary item N° tax due	Income Tax Agency		
		Modifications of identity N° name tax The above is sent to CENACO on the 10th. of each month.	Income Tax Agency		

FIGURE 3.4.2.1.2

3.4.2.2 Personnel Files - 9

These 9 separate files are further subdivided into three groups, as follows:

3.4.2.2.1 Ministry personnel file - 1

This single file has limited use and data. It contains no personal, reference, or job data. It does not contain all the Ministry personnel, nor is it updated. This is because the Department of Administrative Personnel, where this file is located, does not process new hires or people leaving the Ministry. The file contains data relating to salary fines and discounts due to employee tardiness and absenteeism. The file analysis is in Figure 3.4.2.2.1.1.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
National Dept. of Administrative Personnel	Ministry of Education Personnel File Contains the following data: name item N° basic salary The file in incomplete, as it does not contain all the Ministry personnel in La Paz. It does not contain personal, professional or work data. Each person in it has a folder. New personnel do not enter into the file, because hiring is not performed by the Dept., but —rather— by Ministerial Resolutions, which do not come to the Dept.	Request for vacations, permission, leave, sickness; and fines name subject date	Dept. heads & head of the National Dept. of Admin. Personnel	Responses from inquiries Volume: 2-3/day	National Dept. of Admin. Personnel

FIGURE 3.4.2.2.1.1

3.4.2.2.2 Teacher and Administrative Personnel Files - 8

These 8 files are subdivided into urban and rural personnel files. The files -- in terms of format, organization, and data content -- are identical between the urban and rural areas.

3.4.2.2.2.1 Urban area files - 4

These files record the service and professional history of the urban teacher and administrative personnel in the districts. Two files, as analyzed in Figure 3.4.2.2.2.1.1, record urban personnel registration into the national teachers' roster; one file is for urban teacher personnel and the other is for administrative personnel.

The remaining two files are identical in their data content, but not in numbers of persons and updating. The personnel master file is analyzed in Figure 3.4.2.2.2.1.2 and contains only in-service personnel. The secondary file is analyzed in Figure 3.4.2.2.2.1.3 and contains in-service, retired, deceased, and inactive personnel; it is not updated.

3.4.2.2.2.2 Rural area files - 4

Two files, as analyzed in Figure 3.4.2.2.2.2.1, record rural personnel registration into the national teachers' roster. One file is for rural teacher personnel and the other is for administrative personnel.

The remaining two files are identical in their data content and updating, but not in numbers of persons. The personnel master file is analyzed in Figure 3.4.2.2.2.2.2 and contains only in-service personnel. The secondary file is analyzed in Figure 3.4.2.2.2.2.3 and contains in-service,retired, deceased and inactive personnel. It is updated.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Div. of Urban Teacher Personnel	Teachers' Roster Registration Book Volume: 13,667 persons registered Access: Sequential Growth: 1,258 registrations/year Contains teaching personnel of the urban area which are: interim normal school graduates The recording of data began in 1958. Type and time of use: Registrations; 35 hrs/month Classified by: page N° line N° date of ministerial resolution (MR) The data are: page name birthplace line title date MR job title Personnel are classified into normal school graduates or interim.	name birthplace marital status birthdate service time title job title MR N° Date MR The above data is for each teacher.	Teacher's Personal Dossier Volume: 1,258 dossiers per yr.	Responses from inquiries	Teacher Personnel
	Administrative Roster Registration Book Volume: 1,310 persons registered Access: Sequential Growth: 444 registrations/year Contains admin. personnel from the urban area which are: secretaries drivers others laborers janitors The recording of data began in 1967. Type & type of use: Registrations; 12 hrs/mo. Classified by: page N° line N° date of ministerial resolution (MR)	Data is the same as above. Data is for each admin. person	Admin. Personal Dossier: 444 dossiers per year.	Responses from inquiries	Admin. Personnel

FIGURE 3.4.2.2.2.1.1 /p.1

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Urban Teacher Personnel	The data are: page N° name birthdate line N° birthplace service time* date MR marital status date started to work Personnel are not classified according to job titles. *This personnel is not registered until they have a minimum of 5 years work time.	Same as preceding page	Same as preceding page	Same as preceding page	Same as preceding page

FIGURE 3.4.2.2.2.1.1 /p.2

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Div. of Urban Teacher Personnel	Urban File (active personnel only) Volume: 28,000 cards or persons Access: Random Growth: 4.2% annual (net) Contains active teacher and admin. personnel of the urban area; includes: public teachers private teachers religious teachers Classified by: paternal last name maternal last name given name husband's name Type and time of use: personnel registration-47 hrs/mo. qualification & promotion-100 hrs/mo. category verification-316 hrs/mo. for 6 mo. loan application - 44 hrs./mo. Total time of use: April - Sept.: 24.2 hrs/day Oct. - March: 9.1 hrs/day The data per card or person is: personal data professional data service data	Registration: personal data service data professional data	Data: Teacher's personal dossier Volume: 142 dossier/month	Category Verification: district name title years service category	All districts, except La Paz and Cochabamba; Div. of Urban Budget Execution
		Qualification and Promotion: Service data	Teacher's personal dossier Volume: 298 dossiers/year	Data is placed on categorization lists for 15,000 personnel, teachers, and admin. They go out during April-Oct.	
				Loan Application: identity N° -3 persons. name - 3 pers. service time- 3 persons. Loan application is verified against that in the file. Data verification is of 3 pers. 660 applications/month.	CCSSMF (Teachers' complementary social security agency).

FIGURE 3.4.2.2.2.1.2

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Div. of Urban Teacher Personnel	Computation File (Urban personnel only) Volume: Unknown Access: Sequential Growth: 1,500 sheets per year Contains active teacher & admin. personnel of the urban area. Classified by: year paternal last name maternal last name given name Type and time of use: Personnel registration; 22 hrs/mo. The data in this file is not updated after personnel are registered.	Registration: personal data service data	Data: Teacher's personal record Medium: Computation Sheet Div. of Urban Teacher Personnel Volume: Nov.-April 35 sheets/wk. May - Oct. 20 sheets/wk.	None	None

FIGURE 3.4.2.2.2.1.3

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Div. of Rural Teacher Personnel	Rural Teachers' Roster Registration Book Volume: 8,576 teachers registered Access: Sequential Growth: 111 registrations per year Contains teaching personnel from the rural area which are: interim normal school graduates title holders by formation The recording of data began in 1958. Type and time of use: Personnel registration; 9 hrs/year Classified by: page N° line N° date of registration The data are: page N° job title line N° Ministerial Resolution (MR) N° and date name date of registration The personnel is classified as interim, normal school graduates, and title-holders by formation.	name job title MR N° MR date registration date The above data is for each teacher.	Teacher's personal dossier Volume: 111 dossiers/ year.	Responses from inquiries	Teacher Personnel
	Rural Administrative Roster Registration Book Volume: 195 persons registered Access: Sequential Growth: 26 registrations per year Contains admin. personnel from the rural area which are: secretaries janitors laborers shop teachers drivers others The recording of data began in 1962. Type and time of use: Registrations; 2 hrs/year Classified by: page N° line N° registration date	name job title MR N° MR date registration date Data is for each admin. person	Admin. personal dossier Volume: 26 dossiers/ year.	Responses from inquiries	Admin. Personnel

FIGURE 3.4.2.2.2.2.1 /p.1

FILE LOCATION	FILE NAME AND DESCRIPTION		DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Teacher Personnel	The data are: page N° line N° name registration date The personnel are not classified by job title.	job title MR N° MR date	Same as preceding page.	Same as preceding page.	Same as preceding page.	Same as preceding page.

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FIGURE 3.4.2.2.2.2.1/p.2

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Teacher Personnel	Rural File (active personnel only) Volume: 12,324 cards or persons Access: Random Growth: 6% annual (net) Contains teacher and admin. personnel from the rural area Classified by: district paternal last name maternal last name given name Type and time of use: Personnel registration - 27 hrs/mo. Qualification and promotion-2.7 hrs/month category verification - 110 hrs/mo. loan application - 56.7 hrs/mo. Total time of use: Nov. - April: 4.1. hrs./day May - Oct.: 6.7 hrs/day The data per card or person is: personal data professional data service data The data in this file is the same as the data in the urban file.	Registration: personal data service data professional data Qualification and Promotion: Service data	Teacher's and Admin. personal dossier Volume: 25 dossiers per week Computation sheet: 33 sheets/ month.	Category Verification: name job title title years service category district Data is placed on categorization lists for 12,324 personnel, teachers & admin. They go out during June-September.	Districts Division of Rural Budget Execution
				Loan Application: name - 3 persons; identity N°-3 persons; service time-3 persons. Loan application data is verified against that in the file. Data verification is for 3 persons. Volume: 770 applications/mo. Nov.-March & June; 5 applications/mo. other months.	CCSSMF (Teacher's Complementary Social Security)

FIGURE 3.4.2.2.2.2.2

4

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Rural Teacher Personnel	Computation File (rural personnel only) Volume: 16,800 computation sheets Access: Random Growth: 50-60 sheets/wk. Contains teacher and admin. personnel From the rural area which are: passive active retired withdrawn deceased Classified by: binder N° paternal last name district code Type and time of use: Personnel registration-7.5 hrs/wk. Qualification and promotion - 8 hrs./mo. The data in this file is the same as the data in the Rural File for active personnel.	Registration: personal data professional data service data Qualification and Promotion: Service data	Computation Sheet: Division of Rural Teacher Personnel Teachers' and admin. personal record.	None	None

FIGURE 3.4.2.2.2.2.3

3.4.2.3 Materials and Assets Files - 3

These 3 independent files contain data relating to materials, assets and scholastic material shipments.

3.4.2.3.1 Materials File - 1

This file is a record of input and output materials transactions. It reflects only a part of the total materials purchased and used by the Ministry of Education, and it contains no cost data. The file analysis is in Figure 3.4.2.3.1.1.

3.4.2.3.2 Assets File - 1

This file is a collection of assets inventory forms from the urban and rural districts and Ministry offices. It contains cost data. The file analysis is in Figure 3.4.2.3.2.1.

3.4.2.3.3 Scholastic Material File - 1

This file is a record of all scholastic material shipped to the districts and schools. The file is subdivided by donors of scholastic material and types of scholastic material. The donors are USAID, UNICEF, UNESCO and the Spanish government. The types of materials are chalk, certificates, programs, text books, teachers' guides, vehicles, equipment, and didactic material. The analysis is in Figure 3.4.2.3.3.1.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Purchases and Supplies	Materials File Volume: 78 cards or items Access: Random Growth: Random Contains the following materials items: office supplies cleaning supplies sanitary supplies patriotic supplies Classified by: item number item name Each year a new file is created. Type of use: Materials receipts Stock issues The data per item are: N° & name of item year date in or out origin destination quantity in out balance	Materials Receipts: date origin quantity Material Issues: date destination quantity	Purchase receipts from suppliers Materials requests, Ministry offices and depts.	Responses from inquiries	Division of Purchases and Supplies

FIGURE 3.4.2.3.1.1

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Division of Assets	Department File Contains the Inventory Records from the districts, schools and Ministry offices. The Inventory Record is a list of items acquired during the school year. Classification is by departments and provinces.	Item data is as follows: quantity name value The items are: furniture scholastic material office equipment clothes tools others Also includes property items.	Districts, Schools Ministry offices and depts.	Assets Tables: school district types of assets value Property Table: locality ownership name address The above are prepared on request only.	Not identified

FIGURE 3.4.2.3.2.1

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Scholastic Warehouse	Scholastic Material Dispatching Registry Contains dispatches of scholastic material to the districts, such as: programs textbooks guidebooks donated scholastic material certificates Classified by: districts type of material year	Dispatching data: school quantity description date district, province or city	Scholastic Warehouse	None	None

FIGURE 3.4.2.3.3.1

3.4.2.4 Financial Files - 2

These two files are independent and contain data on budget item expenditures for the Ministry of Education budget.

3.4.2.4.1 Accounting File - 1

This file provides the budgetary amounts for expense items assigned to special revenues. All expenses are paid by check from funds in different governmental agencies. The delay time from check emission to account posting is several weeks, which causes -- in many instances -- large differences between estimated and real balances. The file analysis is in Figure 3.4.2.4.1.1.

3.4.2.4.2 Budget File - 1

This file is a record of expenditures made against budget accounts. Expenditures are not controlled, because the amount budgeted by account is unknown. It contains approximately 50 sub-accounts, against which expenditures are made. The major expenditure accounts are:

- Personal services, which are salaries missed through omission or errors on the part of CENACO, when it processes salaries;
- Non-personal services;
- Materials and supplies;
- Fixed and capital assets;
- Transfers.

The accounts and sub-accounts presently used are the same as those used in 1972. Any changes or modifications for 1973, and 1974, are unknown, as they have not received the corresponding information. The file analysis is in Figure 3.4.2.4.2.1.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Accounting Division	**Special Revenues Budget** Contains budgeted amounts by expenditure accounts, corresponding to the special revenues. Expenditures are performed through rotating fund accounts and a petty cash account. Expenditures are also performed through ordinary budget expenditure accounts. Separate files are maintained for rotating fund accounts, ordinary budget accounts and petty cash account.	Petty cash: Invoices - quantity date item value origin	Commercial Firms	Monthly list: date item quantity value	Dept. of Financial Admin.
		Rotating Funds: Payment Orders - description value date interested party	Dept. of Financial Admin.	Check: date account name & N° description value interested party	Interested Party
		Ordinary Budget Accounts: Payment Orders - description value date interested party	Dept. of Financial Admin.	Expenditure Voucher: bank acct.N° account N° description value interested party	Ministry of Finance

FIGURE 3.4.2.4.1.1

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Budget Control Division	Budget Expenditure File Classified by the account numbers indicated in the Ministry of Education Budget Manual for 1972. There is no manual available for 1973 & 1974. The accounts or groups are as follows: 100 Personal Services, except account or subgroup 110, Permanent Employees 200 Non-Personal Services 300 Material and Supplies 400 Fixed and Financial Assets 700 Transfers Expenditures are not controlled with respect to the budgeted amount, because the budgeted amounts are not known. Rather, the file is a registry of expenditures by accounts, established in 1972.	Approved Expenditures date voucher N° description amount The volume of expenditures by accounts (groups) are: 100 Personal Services, except Account 110, Permanent Employees 1973-1294 vouchers Other accounts (groups) 200, 300, 400 and 700 1973-479 vouchers	Div. of Urban Budget Execution Minister, Dept. of Financial Admin., Interested Parties	None	None

FIGURE 3.4.2.4.2.1

3.4.2.5 Public Relations File - 1

This file consists of newspaper articles related to education, directly or indirectly. The file is analyzed in Figure 3.4.2.5.1.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Direction of Information, Public Relations, and Press	File of Newspaper Articles Contains articles from the La Paz, Oruro and Cochabamba newspapers, and some articles from other newspapers (e.g., Santa Cruz)--but irregularly. The articles are on education, in direct or indirect reference.	Educational newspaper articles from Dec., 1973. 8 - 10 articles/day	Newspapers from La Paz, Oruro, Cochabamba, Santa Cruz, others	Responses to inquiries	Minister and Direction of Information, Public Relations and Press

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FIGURE 3.4.2.5.1

3.4.2.6 Archives and Information Files - 3

The archives are contained in two files. The first file consists of two parts with identical information -- i.e., legal statutes relating to education. The first part contains the original statutes; the second contains special copies made fromthe originals, from which additional copies can be made.

The second file contains special copies made from original Ministerial Resolutions issued to teacher and administrative personnel.

The third file, or information file, consists of a registry logging in and out personnel records. The records are brought in by the interested party, who leaves it for the required action. All the records brought in for registry require the signature of the Minister and/or one or more subsecretaries. The time delay for this action can be from several days to several months. The file is for urban personnel records only and is analyzed in Figure 3.4.2.6.1, along with the two archives files.

FILE LOCATION	FILE NAME AND DESCRIPTION	DATA INPUT	SOURCE	DATA OUTPUT	USER
Archives and Information Section	File of General Legal Dispositions (originals) Contains: Supreme Decrees Supreme Resolutions Ministerial Resolutions Classified by: Year Type of disposition The legal dispositions date from 1954.	Volume in 1973 Supreme Decrees: 38 Supreme Resolutions: 78 Ministerial Resolutions: 444	President of the Republic Minister of Education Ministerial Cabinet	Responses to inquiries: 5-6/day	Ministry offices and depts.
	File of General Legal Dispositions (copy book); same as above. The legal disposition copies date from 1911.	Same as above	Same as above	Copies: 3/day	Ministry offices and depts.
	File of Personnel Ministerial Resolutions; in copybooks - teacher & admin. personnel; Classified by: Year Type of Resolution teachers' roster registration Others	Volume in 1973 Ministerial Resolutions: 1790	Minister Subsecretaries	Copies: Registrations-2,000/yr. Others-50/mo.	Teacher and Admin. Personnel
	Ledger of Inputs & Outputs The inputs & outputs refer to personnel records which are registered in the ledger. The records are in the process of obtaining the Minister's and/or subsecretaries' signatures. The ledger is for urban personnel records only.	Volume in 1973 Teacher & Admin. personnel records: 4,518 records	Teacher & Admin. Personnel	Responses to inquiries: 20/day	Teacher and Admin. Personnel

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FIGURE 3.4.2.6.1

3.4.3 Facilities

The facilities studied and analyzed are of two types: Printing facilities and communications facilities.

3.4.3.1 Printing Facilities

Within the Ministry of Education, there are two installed printing facilities. The analysis of the printing facilities is in Figure 3.4.3.1.1.

PRINTING LOCATION	LIST OF EQUIPMENTS	PRESENT USE
Publications Dept. (Dept. of Educational Planning)	4 - offset units, legal size 1 - offset unit, double legal size 3 - multicopiers 1 - plate developer, legal size 1 - photomechanical unit 1 - paper cutter or shear 1 - electronic stencil	Mainly jobs for Educational Planning. Some jobs for Curriculum. Estimated use is less than one-half of the installed capacity.
Dept. of Scholastic Techinical Support - SATE	Audiovisual and Multicopy Section 1 - offset unit, legal size 1 - multicopier, legal size 1 - multicopier, double legal size 2 - photo enlargers 1 - photographic offset unit 1 - dark room	Jobs for Curriculum (programs). Jobs for the Minister's office. Jobs for the Falange Socialista Boliviana. Jobs for schools. Jobs for the Subsecretary of Culture. With programs, use is one-half of the installed capacity; with no programs, use is one-third of the installed capacity.
	Printing Section 1 - linotype 1 - flat printing press, small 1 - flat printing press, large 1 - paper cutter or shear 1 - paper folder 1 - wire binder 1 - string binder.	Jobs for the Minister's Office. Jobs for Curriculm (books and manuals). Jobs for schools. Estimated use is less than one-half of the installed capacity; books, and manuals are no longer printed.

FIGURE 3.4.3.1.1

3.4.3.2 Communications Facilities

The communications facilities were analyzed from three aspects. The first considers the types of communication channels used from the interior, urban and rural districts, to the national level. The second considers the types of communication channels used from the national level to the interior, urban and rural districts. The third considers the types of communications channels used within the national level. In all three, the usage and delay times are given. The above information was summarized in the Communications/Information Systems Model in section 3.1.

3.4.3.2.1 Communication Channels - Interior Districts to the National Level

Three channels are available and used; these are:

- Post office system, for overland mail;
- Ministry personnel traveling via air or land;
- Telephone and telegraph. (These facilities are not available in the department of Pando; if cables are sent, they go airmail, which usually takes 2 to 3 weeks.)

The delay times which were indicated in the Model are average times.

3.4.3.2.2 Communication Channels - National Level to the Interior Districts

The same three channels are used as indicated in the previous section (3.4.3.2.1). However, usage varies from that indicated in the previous section, while delay times are much the same.

3.4.3.2.3 Communication Channels - National Level (internal and external)

In this case, the channels available are:

- Telephone system; the 8% usage and 2-hour average delay time is due to the fact that there are 10 telephones available to 29 administrative offices containing 256 employees. As a consequence, the following channel is the most common.
- Messenger system; this system consists of employing the service personnel to transmit letters, documents, messages, etc. between offices.
- Post office system; this is the least used, due to its lengthy delay time.

4.0 OPERATIONS

In this section, the operating dynamics of the present communications/information systems are described in the framework of activity classifications. Time, flow and sequence of events are factors identified in this part of the analysis.

In the course of the study, a large number of activities were identified; most of them are related to a few well-defined activities. The activities are classified and graphically described in the following section.

4.1 Activities

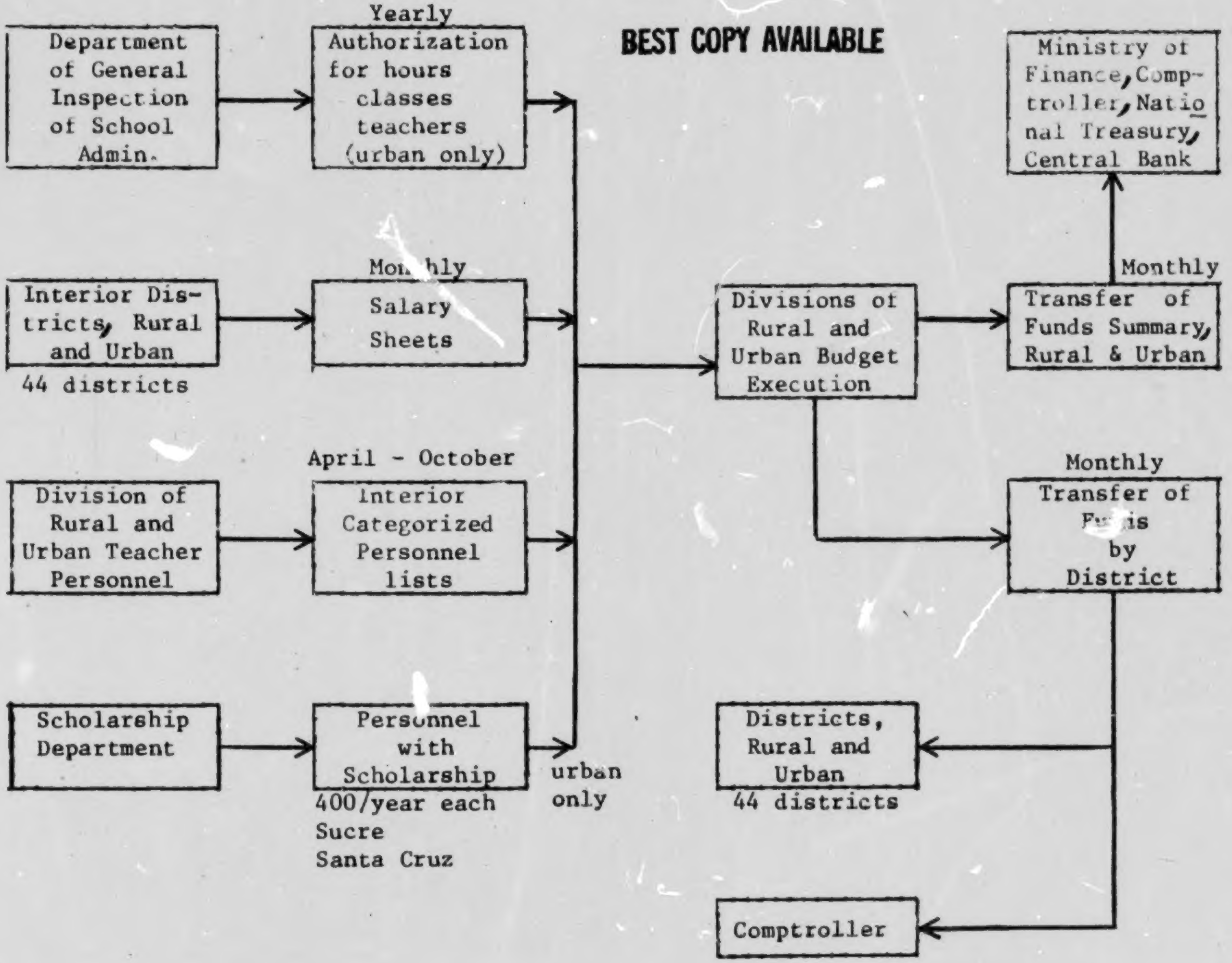
The activities are identified as follows:

- Salaries
- Personnel
- Statistics
- Assets inventories
- Scholastic material distribution
- Food inventories
- Purchasing and supplies
- Budget control
- Archives and information
- Public relations

The flow diagrams which follow for each activity indicate the types of data inputs and outputs, the respective sources and destinations, files associated with the activity, and the departments and offices involved in the activity. In addition, pertinent time data is given, where applicable, and explanatory notes are provided. In some cases, more than one flow diagram is given per activity; these are titled or labeled for clarification.

SALARIES

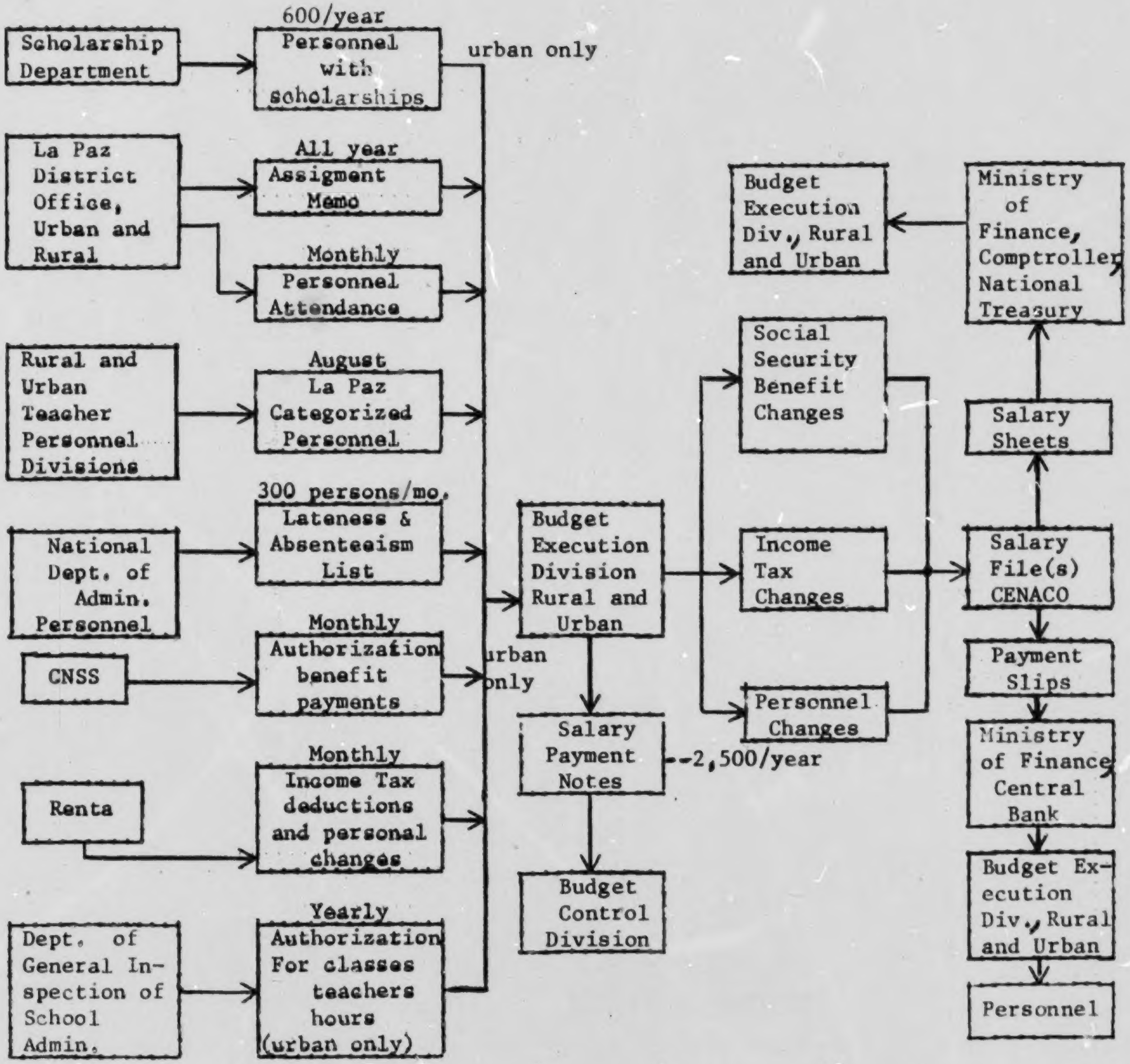
This salary diagram shows the data used in preparing the Transfer of Funds, which is used in providing funds to the districts for payment of salaries to teacher and administrative personnel.


Department of General Inspection of School Admin.
Yearly
Authorization for hours classes teachers (urban only)
Interior Districts, Rural and Urban
44 districts
Monthly
Salary Sheets
Division of Rural and Urban Teacher Personnel
April - October
Interior Categorized Personnel lists
Scholarship Department
Personnel with Scholarship
400/year each
Sucre
Santa Cruz
urban only
Divisions of Rural and Urban Budget Execution
Monthly
Transfer of Funds Summary, Rural & Urban
Ministry of Finance, Comptroller, National Treasury, Central Bank
Monthly
Transfer of Fu is by District
Districts, Rural and Urban
44 districts
Comptroller

SALARIES

Ministry of Education Personnel/Urban and Rural District of La Paz

This diagram indicates the flow and type of data used in the preparation of salary sheets and payment vouchers. These are prepared by CENACO in La Paz, where the respective files are kept. CENACO prepares these items for all Ministry personnel and personnel in the rural and urban district of La Paz. The same process is used in the urban district of Cochabamba, where CENACO prepares the salary sheets and payment slips.

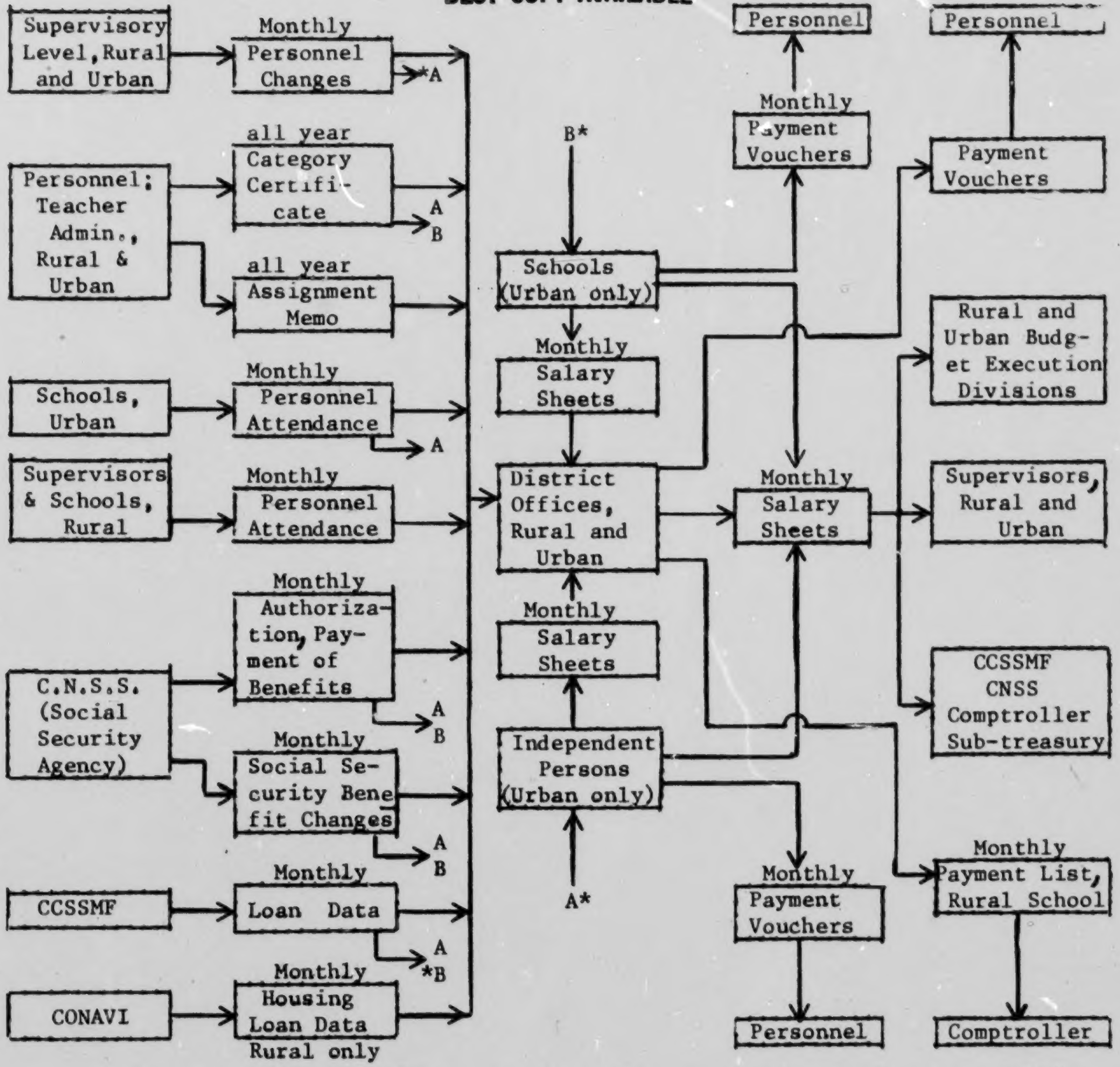

Scholarship Department
600/year
Personnel with scholarships
urban only
La Paz District Office, Urban and Rural
All year
Assigment Memo
Monthly
Personnel Attendance
Rural and Urban Teacher Personnel Divisions
August
La Paz Categorized Personnel
National Dept. of Admin. Personnel
300 persons/mo.
Lateness & Absenteeism List
CNSS
Monthly
Authorization benefit payments
urban only
Renta
Monthly
Income Tax deductions and personal changes
Dept. of General Inspection of School Admin.
Yearly
Authorization For classes teachers hours (urban only)
Budget Execution Division Rural and Urban
Salary Payment Notes
--2,500/year
Budget Control Division
Social Security Benefit Changes
Income Tax Changes
Personnel Changes
Budget Execution Div., Rural and Urban
Ministry of Finance, Comptroller, National Treasury
Salary Sheets
Salary File(s) CENACO
Payment Slips
Ministry of Finance Central Bank
Budget Execution Div., Rural and Urban
Personnel

SALARIES

Interior Rural and Urban Districts

Salary sheets are prepared by the respective district offices for all rural personnel. Salary sheets for urban personnel are prepared by the respective district offices, the schools, and also by independent persons. When the schools and independent persons prepare salary sheets, a copy goes to the district office. However, they go through the set procedures in the government agencies to obtain the funds to pay the teachers. This last aspect is not controlled by the district offices.

This diagram indicates the sources and data used in preparing the monthly data sheets in all the districts. Data sheets are prepared with 16 to 18 copies each for the different government agencies. In the case of the urban district of Cochabamba, the salary sheets and payment vouchers are prepared by CENACO in Cochabamba.

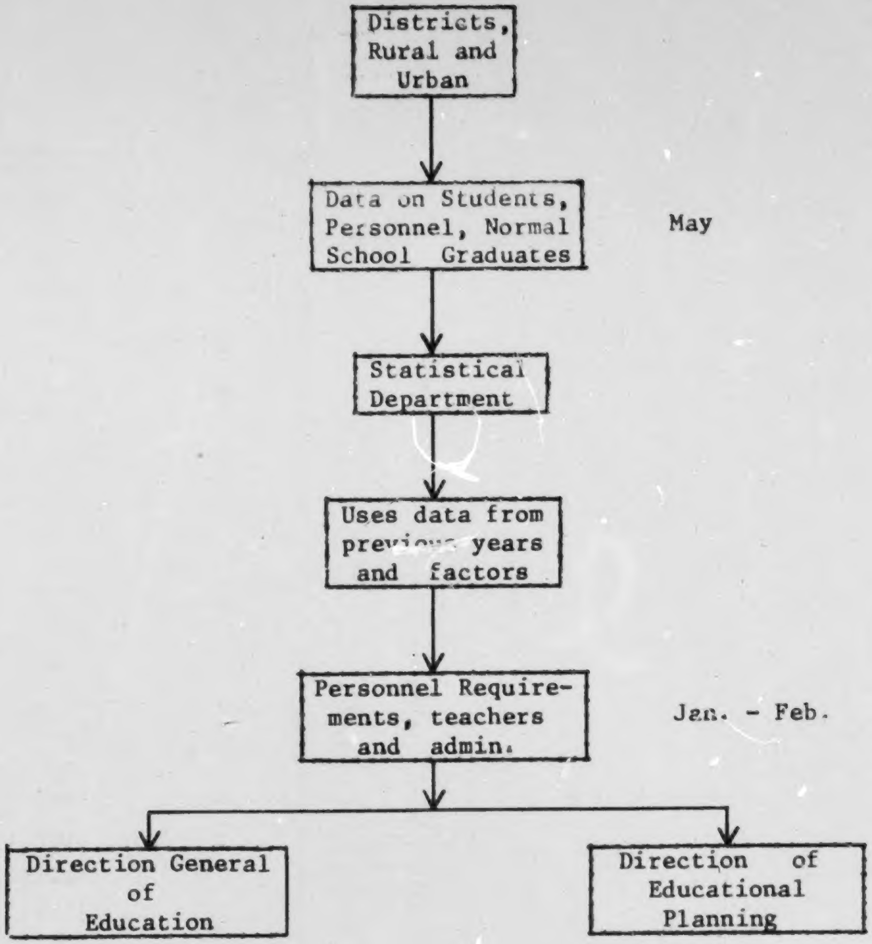

Supervisory Level, Rural and Urban
Monthly Personnel Changes
*A
Personnel; Teacher Admin., Rural & Urban
all year Category Certificate
A
B
all year Assignment Memo
Schools, Urban
Monthly Personnel Attendance
A
Supervisors & Schools, Rural
Monthly Personnel Attendance
C.N.S.S. (Social Security Agency)
Monthly Authorization, Payment of Benefits
A
B
Monthly Social Security Benefit Changes
A
B
CCSSMF
Monthly Loan Data
A
*B
CONAVI
Monthly Housing Loan Data Rural only
B*
Schools (Urban only)
Monthly Salary Sheets
District Offices, Rural and Urban
Monthly Salary Sheets
Independent Persons (Urban only)
A*
Personnel
Monthly Payment Vouchers
Monthly Salary Sheets
Monthly Payment Vouchers
Personnel
Personnel
Payment Vouchers
Rural and Urban Budget Execution Divisions
Supervisors, Rural and Urban
CCSSMF CNSS Comptroller Sub-treasury
Monthly Payment List, Rural School
Comptroller

*The arrows marked "A" go together; the same applies in the case of "B".

PERSONNEL

Personnel requirements are determined by the Statistical Department. However, the Department uses data from previous years and a set of factors in the determination -- e.g., death rate, retirement rate, normal school graduation rate, loss rate, etc. Data from previous years is used, because up-to-date data is not available, due to the inherent time dalay in the Department's data-collection system.

The requirements figures which are provided are general in nature and go to the grade level in a given district.


Districts, Rural and Urban
Data on Students, Personnel, Normal School Graduates
May
Statistical Department
Uses data from previous years and factors
Personnel Requirements, teachers and admin.
Jan. - Feb.
Direction General of Education
Direction of Educational Planning

TEACHING AND ADMINISTRATIVE PERSONNEL REQUIREMENTS

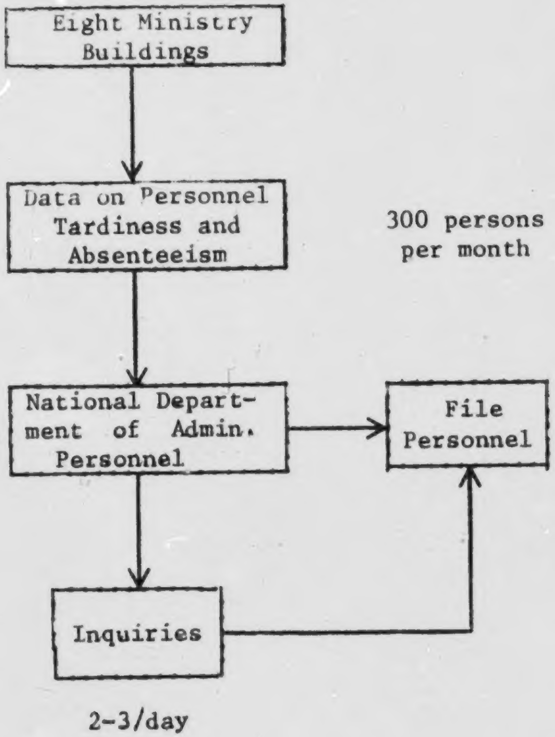
PERSONNEL

Ministry Personnel Distribution List

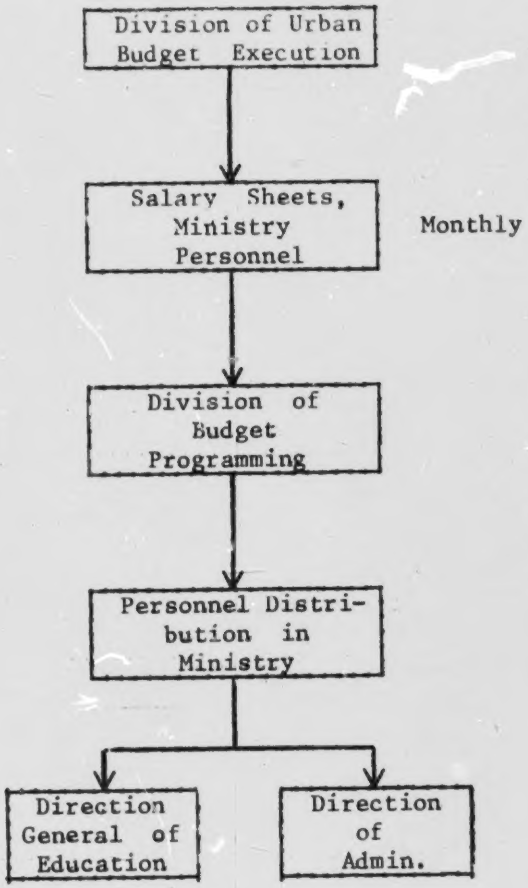
This list is primarily used for information purposes, particularly on those persons who have a category classification.

Ministry Personnel Tardiness and Absenteeism

There are lists which come from eight Ministry buildings and report personnel tardiness and absenteeism on a monthly basis. On the average, 300 persons are on the lists each month. The Ministry personnel file is up-dated with these reports.


Eight Ministry Buildings
Data on Personnel Tardiness and Absenteeism
300 persons per month
National Department of Admin. Personnel
File Personnel
Inquiries
2-3/day

MINISTRY PERSONNEL
TARDINESS AND ABSENTEEISM


Division of Urban Budget Execution
Salary Sheets, Ministry Personnel
Monthly
Division of Budget Programming
Personnel Distribution in Ministry
Direction General of Education
Direction of Admin.

MINISTRY PERSONNEL
DISTRIBUTION LIST

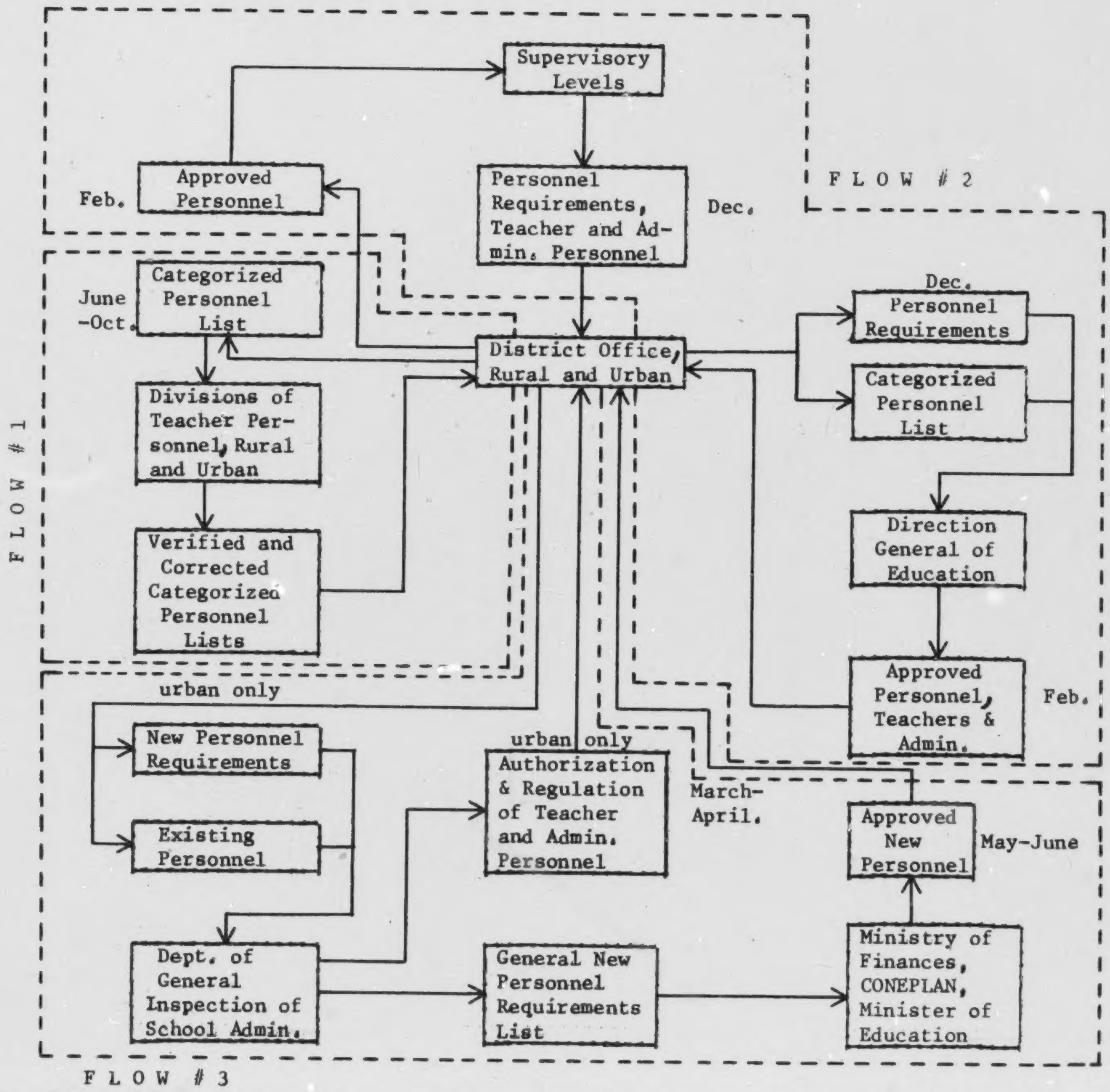
PERSONNEL

This flow diagram covers three personnel data flows. The first involves verifying category classifications and is unrelated to the other data flows.

The second flow revolves around personnel requirements and originates at the supervisory levels. An approved personal list is generated by the Direction General of Education and goes to the district offices; from there, it is distributed at the supervisory level. This flow does not include new personnel.

The third flow deals with the determination of new personnel for the districts (primarily for the urban areas). The initial determination is made by the Direction General of Education, for both rural and urban areas.

Several months later, an approved new personnel list is provided to the district office; consequently, some persons are changed during the school year to reflect the approved list.

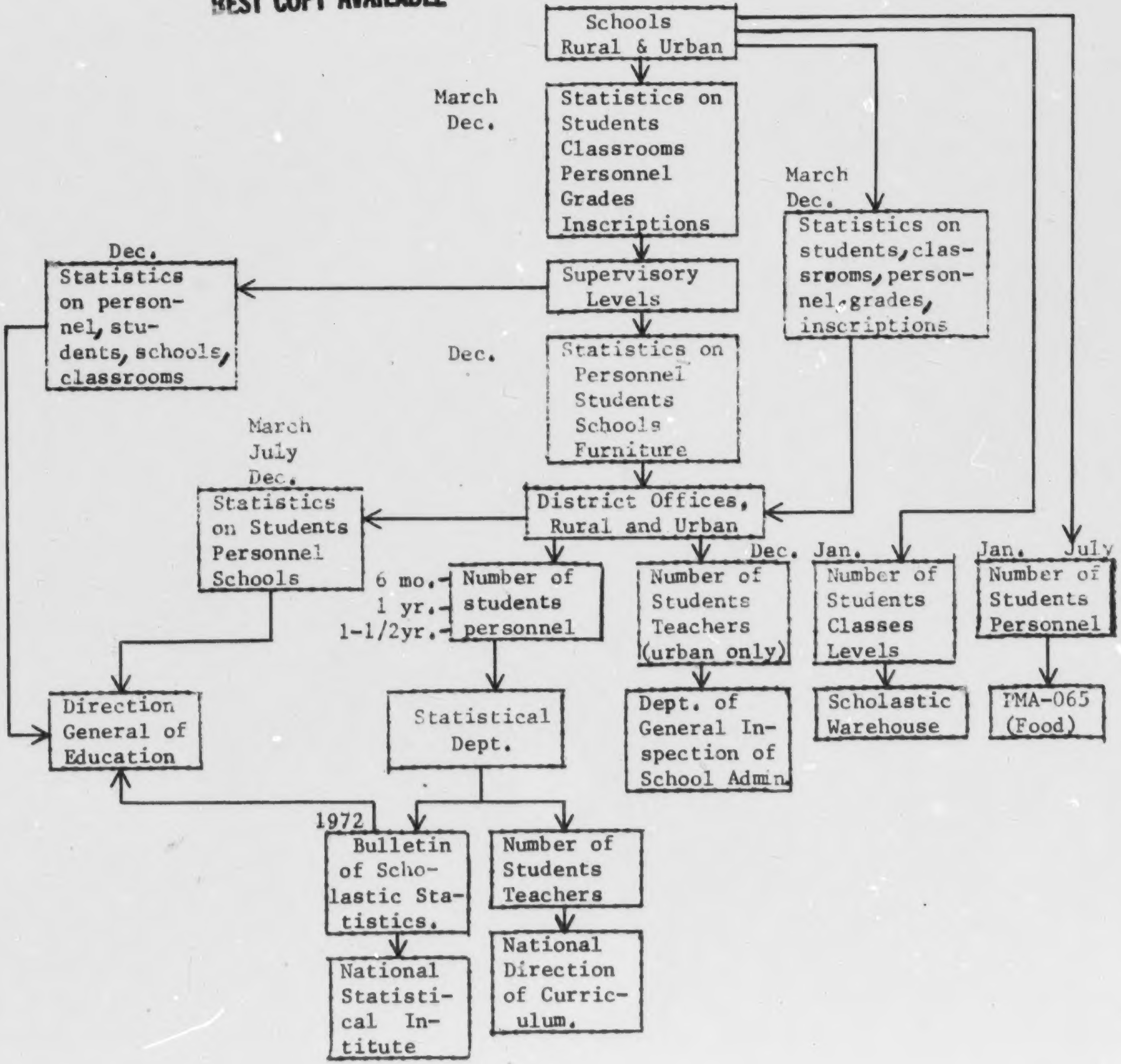


FLOW # 1
FLOW # 2
FLOW # 3
Supervisory Levels
Personnel Requirements, Teacher and Admin. Personnel
Dec.
Approved Personnel
Feb.
Categorized Personnel List
June -Oct.
Divisions of Teacher Personnel, Rural and Urban
Verified and Corrected Categorized Personnel Lists
District Office, Rural and Urban
Dec.
Personnel Requirements
Categorized Personnel List
Direction General of Education
Approved Personnel, Teachers & Admin.
Feb.
urban only
New Personnel Requirements
Existing Personnel
Dept. of General Inspection of School Admin.
urban only
Authorization & Regulation of Teacher and Admin. Personnel
March-April.
General New Personnel Requirements List
Approved New Personnel
May-June
Ministry of Finances, CONEPLAN, Minister of Education

STATISTICS

The flow of statistical data from the schools, supervisory levels, and district offices to the Direction General of Education follows an established routine.

The data received by the remaining national level offices is through separate channels. In the case of the Statistical Dept., the data received is independent of that received by the Direction General of Education. The Dept.'s data-collection system gives a delay time of 6 months to 1-1/2 years to all data received, and — as a consequence — the Bulletin of Scholastic Statistics which it ussues is 1-1/2 years late.


Schools Rural & Urban
March Dec.
Statistics on Students Classrooms Personnel Grades Inscriptions
March Dec.
Statistics on students, classrooms, personnel, grades, inscriptions
Supervisory Levels
Dec.
Statistics on personnel, students, schools, classrooms
Dec.
Statistics on Personnel Students Schools Furniture
March July Dec.
Statistics on Students Personnel Schools
District Offices, Rural and Urban
6 mo.
1 yr.
1-1/2yr.
Number of students personnel
Dec.
Number of Students Teachers (urban only)
Jan.
Number of Students Classes Levels
Jan. July
Number of Students Personnel
Direction General of Education
Statistical Dept.
Dept. of General Inspection of School Admin.
Scholastic Warehouse
PMA-065 (Food)
1972
Bulletin of Scholastic Statistics.
Number of Students Teachers
National Statistical Intitute
National Direction of Curriculum.

ASSETS INVENTORIES

The inventory records contain an inventory on the following type items:

School furniture

Office furniture

Scholastic material, purchased and donated

Tools

Properties

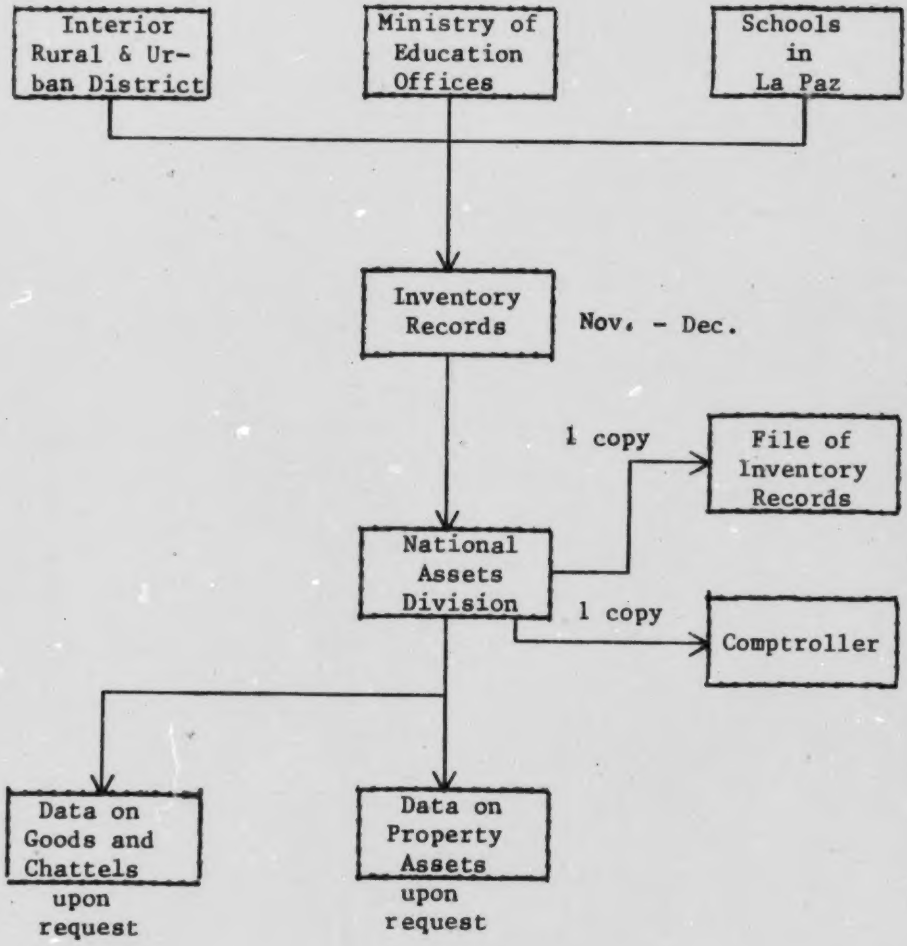
Books

Clothing

Office Equipment

All other non-consumable items

The inventory records include cost data.


Interior Rural & Urban District
Ministry of Education Offices
Schools in La Paz
Inventory Records
Nov. - Dec.
1 copy
File of Inventory Records
National Assets Division
1 copy
Comptroller
Data on Goods and Chattels
upon request
Data on Property Assets
upon request

SCHOLASTIC MATERIAL

DISTRIBUTION

Purchased items to be distributed are:

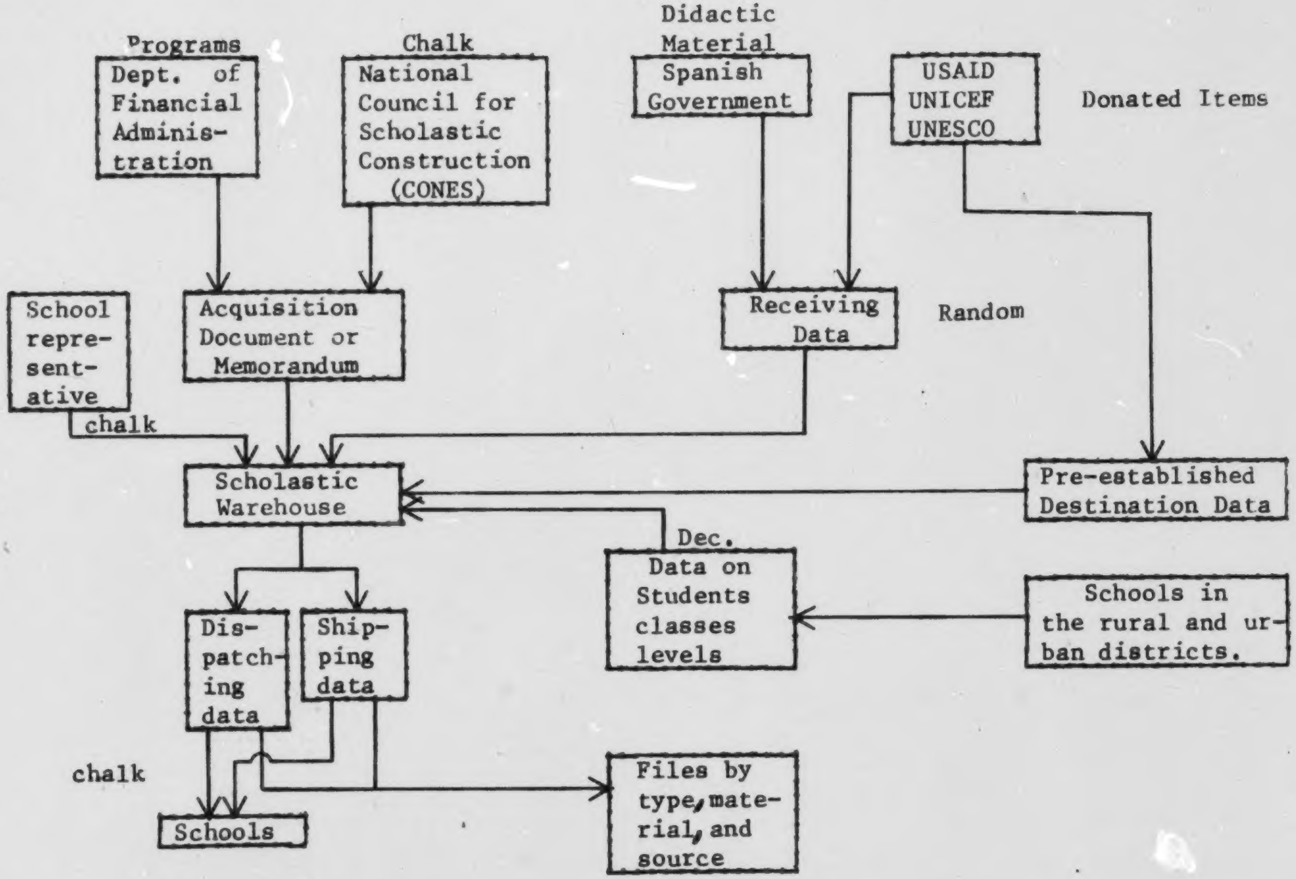
- Chalk
- Programs (for teaching purposes)

Donated items to be distributed are:

- Text books and guides
- Vehicles
- Equipment and machinery
- Other scholastic material

Chalk is distributed during the months of February and March.

The scholastic material from the Spanish Government has not been completely distributed. This material is obsolete; indeed, it was obsolete when purchased.

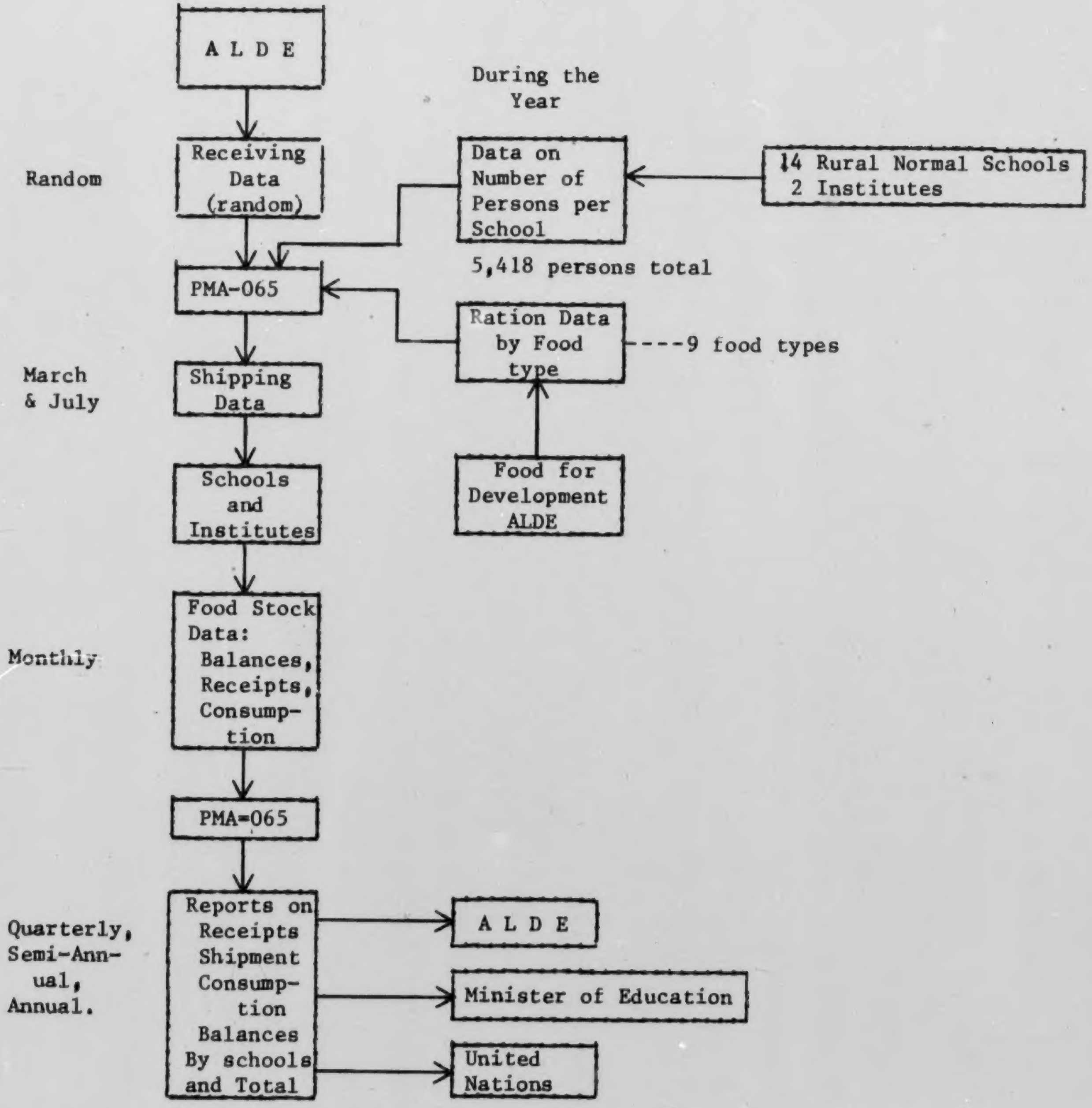

Programs
Dept. of Financial Administration
Chalk
National Council for Scholastic Construction (CONES)
Didactic Material
Spanish Government
USAID UNICEF UNESCO
Donated Items
School representative
chalk
Acquisition Document or Memorandum
Receiving Data
Random
Scholastic Warehouse
Pre-established Destination Data
Dec.
Data on Students classes levels
Schools in the rural and urban districts.
Dispatching data
Shipping data
chalk
Schools
Files by type, material, and source

FOOD INVENTORIES

The nine food types are:

- Flour
- Canned meat
- Dried fruit (raisins)
- Soybean oil
- Powdered milk
- Canned cheese
- Dried fish
- Canned fish
- Powdered egg

The food is provided for students, admin. and teacher personnel in the schools. It is donated by various countries and provided by the United Nations.


A L D E
Random
Receiving Data (random)
During the Year
Data on Number of Persons per School
14 Rural Normal Schools
2 Institutes
5,418 persons total
PMA-065
Ration Data by Food type
---9 food types
Food for Development ALDE
March & July
Shipping Data
Schools and Institutes
Monthly
Food Stock Data: Balances, Receipts, Consumption
PMA-065
Quarterly, Semi-Annual, Annual.
Reports on Receipts Shipment Consumption Balances By schools and Total
A L D E
Minister of Education
United Nations

PURCHASING AND SUPPLIES

Large and special items are:

- Office furniture and equipment
- Vehicles

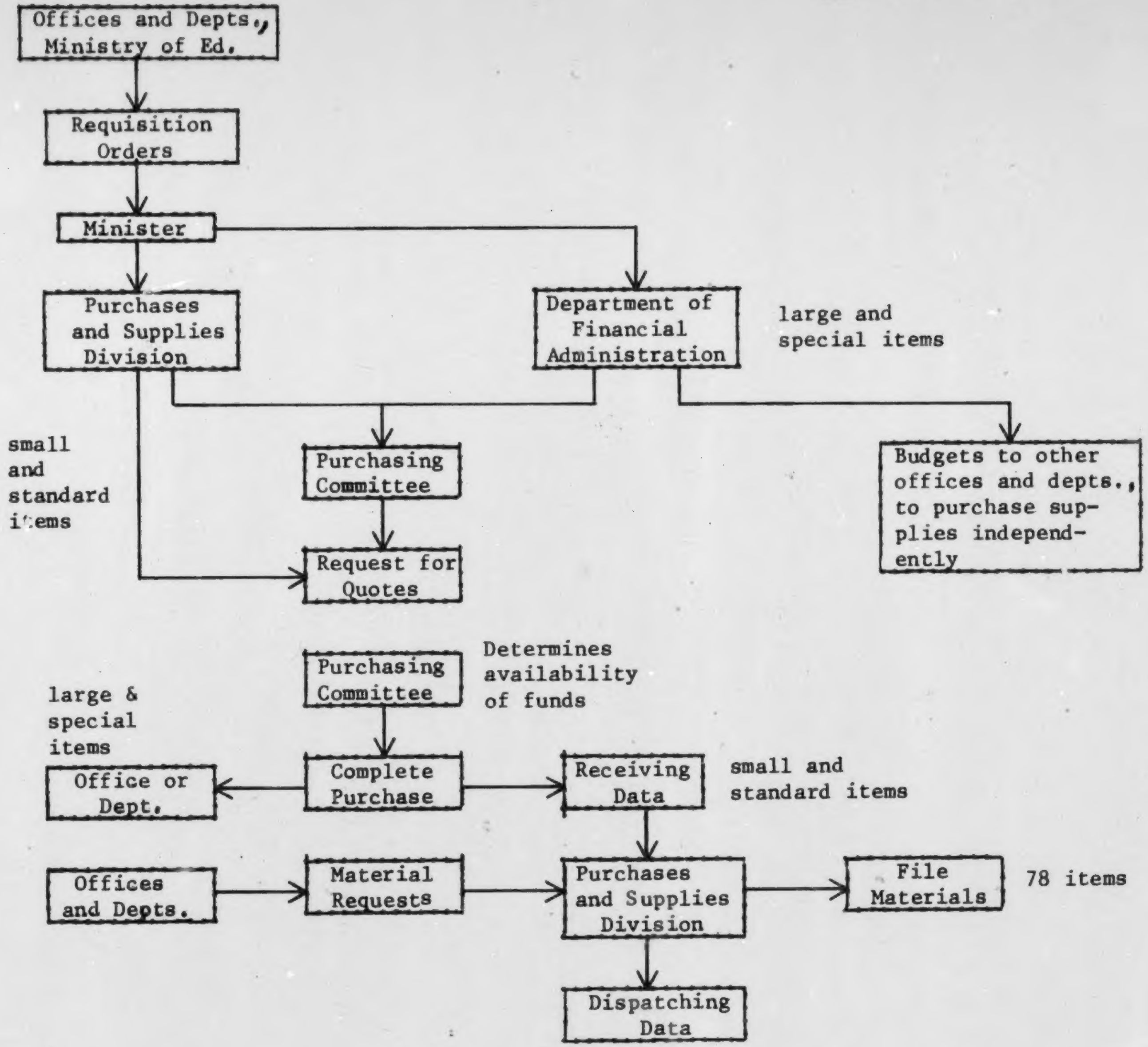
Small and standard items are:

- Office supplies
- Cleaning supplies
- Sanitary supplies
- Patriotic supplies

The supplies are usually purchased every:

3 - 6 months, depending on availability of funds.

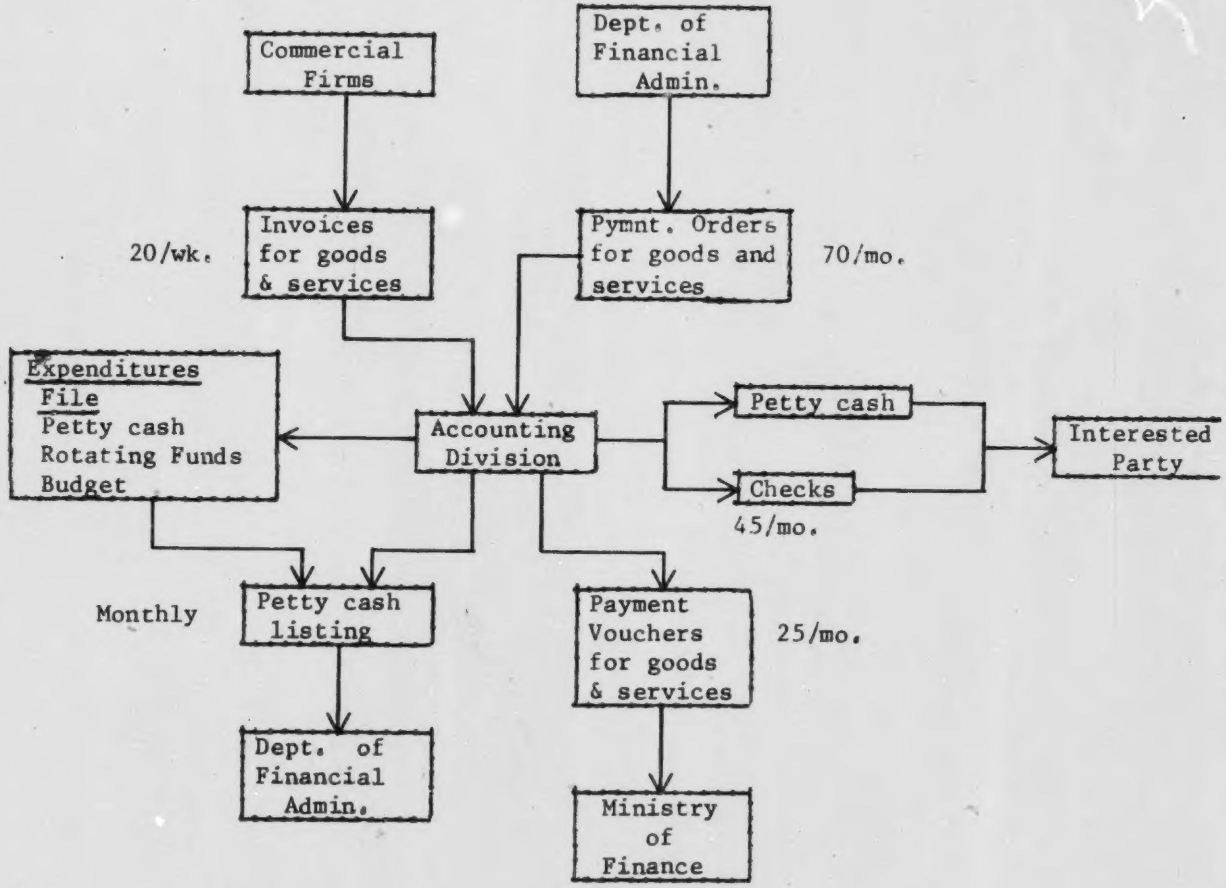
Purchasing is performed independently by several offices and departments. However, all invoices go to the Department of Financial Administration.


Offices and Depts., Ministry of Ed.
Requisition Orders
Minister
Purchases and Supplies Division
Department of Financial Administration
large and special items
small and standard items
Purchasing Committee
Request for Quotes
Budgets to other offices and depts., to purchase supplies independently
Purchasing Committee
Determines availability of funds
large & special items
Office or Dept.
Complete Purchase
Receiving Data
small and standard items
Offices and Depts.
Material Requests
Purchases and Supplies Division
File Materials
78 items
Dispatching Data

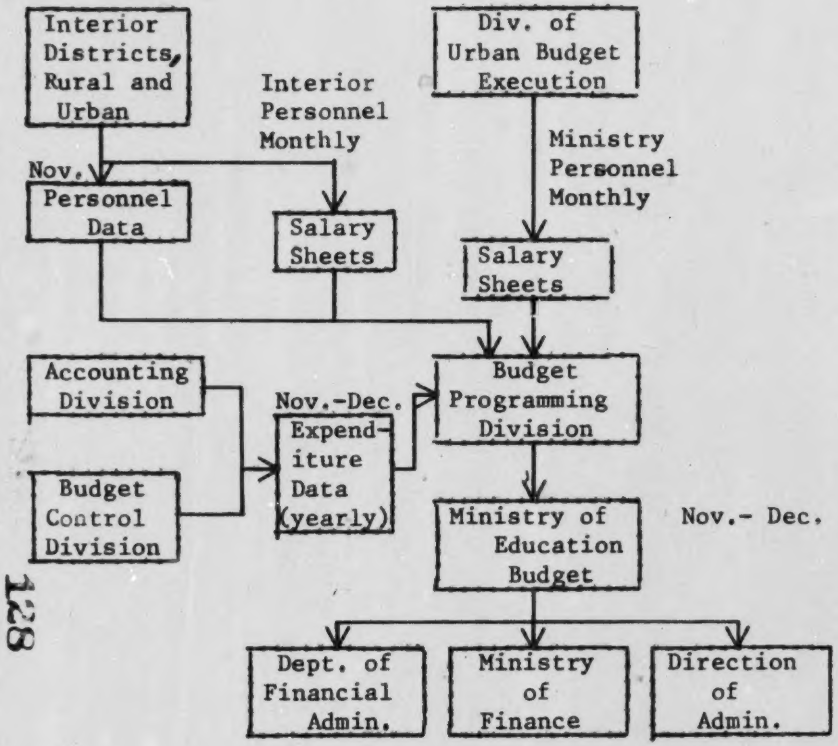
BUDGET CONTROL

This diagram traces the flow of invoices and payment orders for goods and services to their payment through the Accounting Division. The true function of this division is the maintenance of a file of expenditures made against special revenue accounts. The special revenues come from local grants, certificate sales, and personnel payroll deductions. The revenues are not part of the Ministry of Education budget.

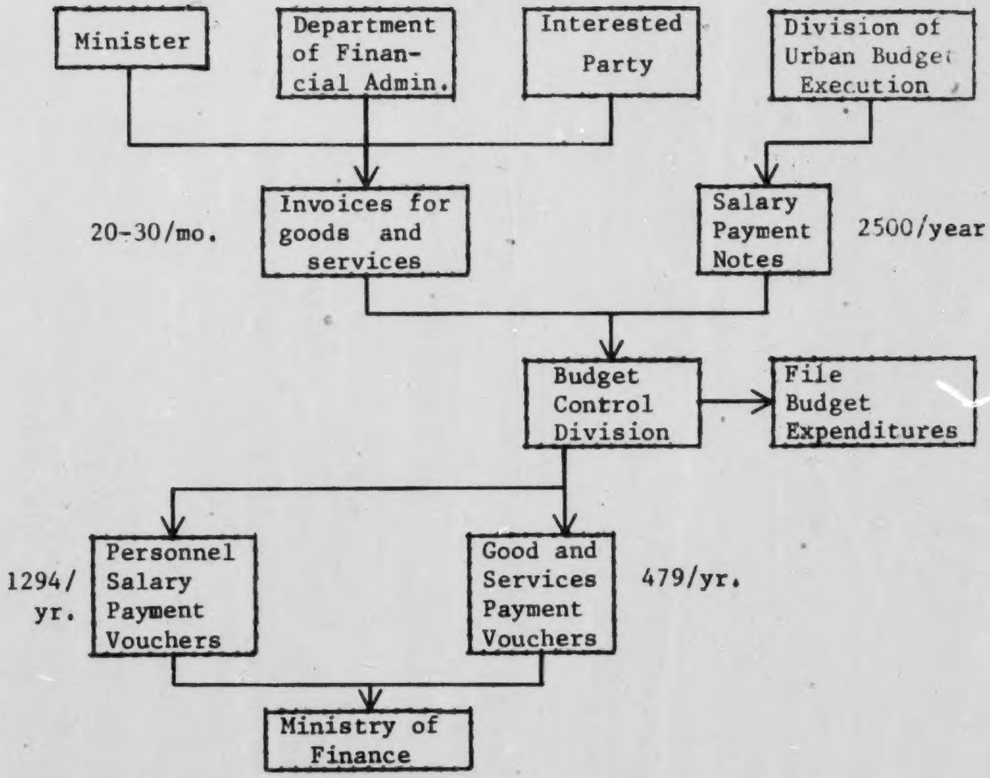
Payment for goods and services is made through petty cash, checks, and payment vouchers which are processed in the Ministry of Finance.


Commercial Firms
Dept. of Financial Admin.
20/wk.
Invoices for goods & services
Pymnt. Orders for goods and services
70/mo.
Expenditures File
Petty cash
Rotating Funds
Budget
Accounting Division
Petty cash
Checks
45/mo.
Interested Party
Monthly
Petty cash listing
Payment Vouchers for goods & services
25/mo.
Dept. of Financial Admin.
Ministry of Finance

BUDGET CONTROL


Interior Districts, Rural and Urban
Interior Personnel Monthly
Div. of Urban Budget Execution
Ministry Personnel Monthly
Nov.
Personnel Data
Salary Sheets
Salary Sheets
Accounting Division
Nov.-Dec.
Budget Programming Division
Expenditure Data (yearly)
Budget Control Division
Ministry of Education Budget
Nov.- Dec.
Dept. of Financial Admin.
Ministry of Finance
Direction of Admin.

This flow indicates the several types and sources of data used in preparing the annual educational budget. All the data received is in raw form. It is prepared in usable form during most of the year, so that the budget can be prepared at the end of the year.


Minister
Department of Financial Admin.
Interested Party
Division of Urban Budget Execution
20-30/mo.
Invoices for goods and services
Salary Payment Notes
2500/year
Budget Control Division
File Budget Expenditures
1294/ yr.
Personnel Salary Payment Vouchers
Good and Services Payment Vouchers
479/yr.
Ministry of Finance

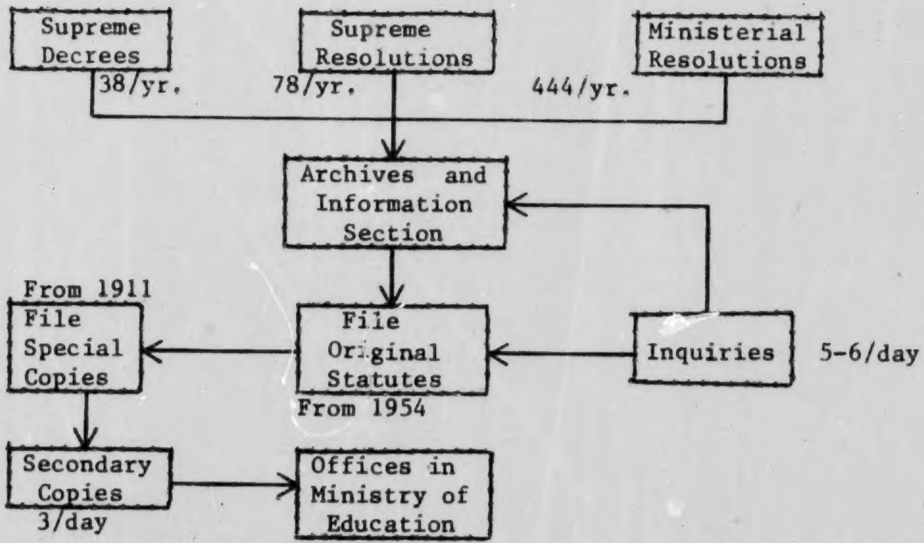
The Budget Control Division's principal function is the preparation of salary payment vouchers for personnel whose salaries were not processed by CENACO, whether because of error or ommissions on the part of CENACO or the Urban Budget Execution Division.

The Budget Control Division also maintains a file recording expenditures for goods and services made against educational budget accounts. However, the accounts carried do not have the budgeted amounts indicated. Budget control is realized at the Ministry of Finance.

ARCHIVES AND INFORMATION

Supreme Decrees and Resolutions relate to education policy and come from the President of the Republic and ministers. Ministerial Resolutions relate to internal educational policy and matters within the Ministry and come from the Minister of Education.

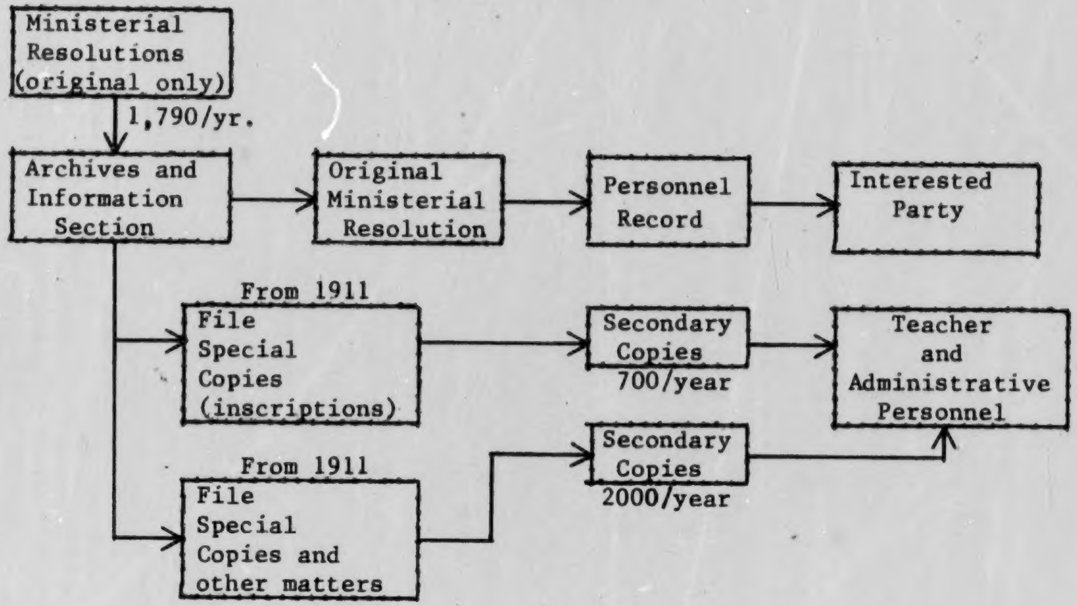
The elapsed time in making secondary copies from the special copy is one day.


Supreme Decrees
38/yr.
Supreme Resolutions
78/yr.
Ministerial Resolutions
444/yr.
Archives and Information Section
From 1911
File Special Copies
File Original Statutes
From 1954
Inquiries
5-6/day
Secondary Copies
3/day
Offices in Ministry of Education

These particular Ministerial Resolutions are matters and dispositions regarding all the teacher and administrative personnel in the educational system. They come from the Minister and Subsecretaries.

The elapsed time in making special copies from the original is 2 days.

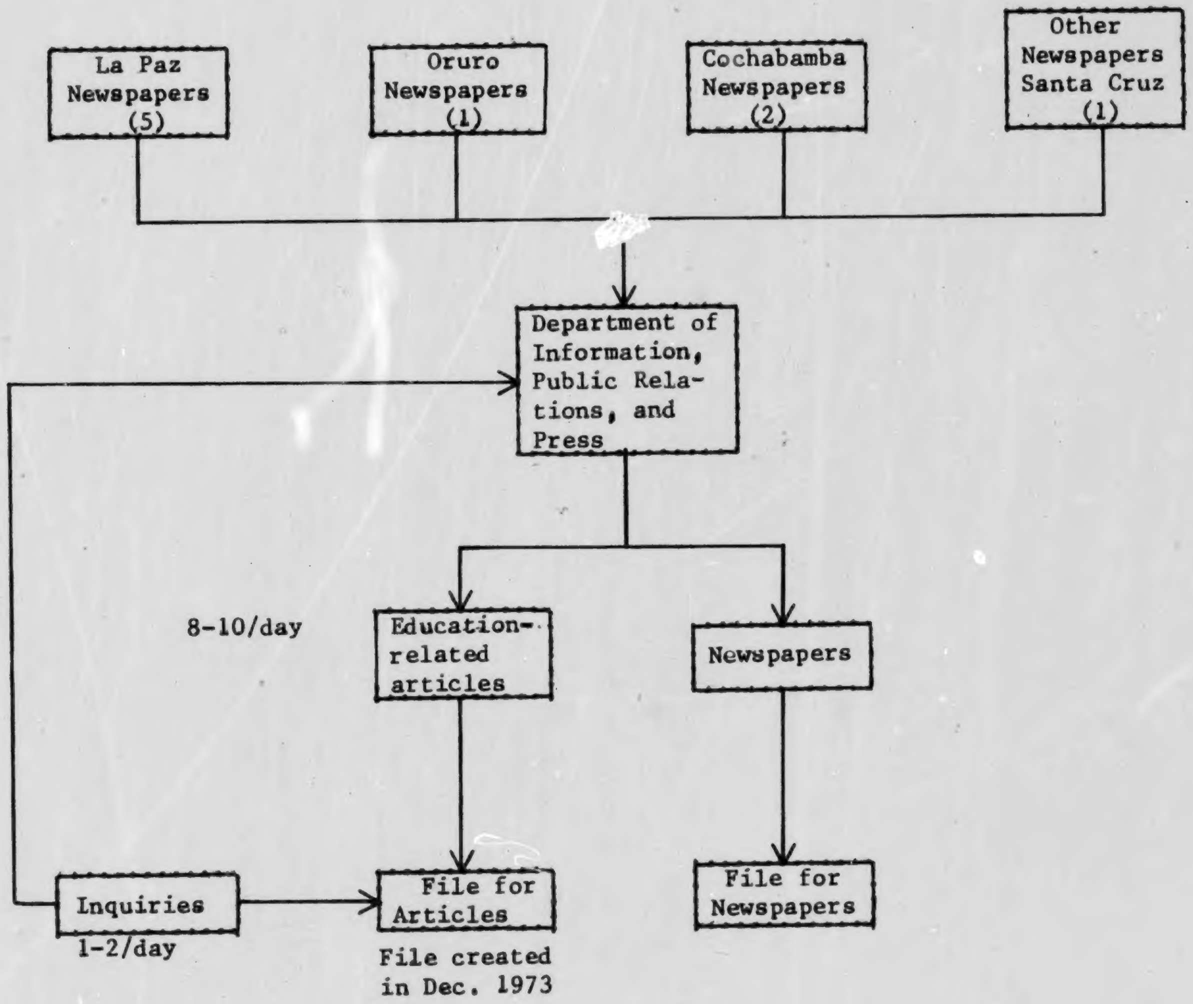
The elapsed time in making secondary copies from the special copy is one day.


Ministerial Resolutions (original only)
1,790/yr.
Archives and Information Section
Original Ministerial Resolution
Personnel Record
Interested Party
From 1911
File Special Copies (inscriptions)
Secondary Copies
700/year
Teacher and Administrative Personnel
From 1911
File Special Copies and other matters
Secondary Copies
2000/year

PUBLIC RELATIONS

The public relations and information office receives the principal newspapers of the country. After initial use, they are filed away.

Since December, 1973, articles relating to education have been cut out and filed for future reference and inquiry.


La Paz Newspapers (5)
Oruro Newspapers (1)
Cochabamba Newspapers (2)
Other Newspapers Santa Cruz (1)
Department of Information, Public Relations, and Press
8-10/day
Education-related articles
Newspapers
Inquiries
1-2/day
File for Articles
File created in Dec. 1973
File for Newspapers

5.0 ADDITIONAL COMMENTS: THE COMMUNICATION CHAIN

The foregoing section states -- in terse and graphic terms -- the present condition of communications/information within the administrative structure of the Bolivian educational system. To give the reader added perspective into existing problems, however, the following narrative commentary is offered.

We have seen that communication flow follows the lines of the established hierarchy within the system -- e.g., Ministry - District Director - Supervisor(s) - School/Nucleo Director - Teacher Personnel; obviously, the flow can go in either direction, depending on the nature and origin of the communication. Use is made of regular commercial channels (mail, telegraph, telephone), as well as informal ones (buses, trucks, travelers). The system is woefully slow and unreliable.

But other aspects of the system make it even more unsatisfactory. These can perhaps be better appreciated when viewed in relation to the various links in the communication chain:

5.1 Ministry - District Directorate:

There is no permanent, rapid two-way means of communication. Communications arriving in the districts -- due to the time delay -- often demand that action be taken or information supplied by a deadline date which actually precedes their date of arrival. When the district responds, it is seldom informed whether its response is received, is adequate or deficient, is useful, etc. Similarly, communications originating in the districts receive either no response or a very late one. Too often, district officials -- if they want to be sure to communicate -- must either travel to La Paz or call by radio-telephone. Both methods are expensive; travel is time-consuming; and calls are often fruitless, since national officials are seldom in their offices. On an irregular basis, national officials visit the districts; also, irregularly district officials (directors and supervisors) are called to La Paz, individually or in groups.

Thus, we have a system which is by no means systematic. Communication is on an ad hoc, by-need-only basis, and its arrival is always a question of "tarde, mal, o nunca". Such haphazardness and lateness can have a deleterious effect on the entire educational process (e.g., the late arrival of pedagogical materials or information/directives pertaining to examinations). Time and money is often wasted on travel, phone calls, or telegrams (with the individual often having to pay from his own pocket). And there is no real, regular opportunity (e.g., a national-level congress) for national and district officials to sit down together to solve educational problems and plan educational policy on a rational, collegial basis.

5.2 Within the District Directorate: Surprisingly, even within the district offices, communication is informal and by-need-only. There are regular meetings of the director and his supervisors at the beginning, middle, and end of the school year. Otherwise, meetings are irregular, solicited by an individual supervisor who needs to confer with his director, or called by the director only when he needs to talk with an individual supervisor or with all of the supervisors (to discuss district affairs or -- as is usually the case -- to pass on instructions, circulars, or other information received from La Paz). In extreme instances, virtually no communication exists within some district directorates: Meetings are sporadic; there is no coordination between director and supervisors; there are no intra-office circulars; no work plan is established, and no orientation is provided to the supervisors; information from La Paz is often received by the supervisors through the press or radio before it is conveyed to them by the director.

As in the case with district directors, supervisors have no real opportunity to congregate with their colleagues from other districts, to discuss common experiences and problems, to share ideas and viewpoints, to broaden their professional outlook.

5.3 District Directorate - Schools/Nucleos

A supervisor virtually always acts as the mediator in communication between the district director and the school/nucleo. At this level, the problem is twofold. On the one hand, there is the usual difficulty of getting communications back and forth between the two entities; on the other, there is the enormous difficulty of transportation facilities which would allow the supervisor to visit the schools under his jurisdiction. These will be dealt with separately, although they are very definitely interrelated.

In the district capital, there is little communication difficulty between the urban directorate and schools within the city; typically, it is conducted (in either direction) by messenger, telephone, or personal interview. The problem lies in communication between the directorate (urban or rural)and the provincial school or the nucleo. In urgent cases, a telegram can be sent by the directorate (though financial considerations preclude a reply by the same method, unless the school/nucleo director wants to pay for it himself), or the school/nucleo director can travel to the capital (again, at his own expense). Again, the waste of time and money makes thesemethods inefficient; additionally, even a telegram takes one to three days to arrive, and -- of course -- in some places there is no telegraph. Usually, however, communication consists of the district directorate's conveying a circular/directive received from La Paz or a memorandum/order originating in the directorate, or the school/nucleo's sending a reply to one of the foregoing or dispatching statistical or other data. With the exception of certain statistical data and periodical reports, which are solicited from and provided by the schools/nucleos on a more-or-less regular basis, all of this communication is -- again -- on an irregular, by-need-only basis.

Unless a supervisor happens to be traveling to a school/nucleo, a written communication would be sent by the district directorate via bus, private vehicle, a traveler, or a teacher visiting the capital; it would be taken to some location in the general vicinity of its eventual destination, then passed on to another person going to the school/nucleo in question. Essentially, the process is reversed, when the school/nucleo director sends a communication to his supervisor in the district directorate.

At times -- along with the corresponding written communication -- a district directorate will use public radio to braodcast certain directives/ information. Again, cost is an inhibiting factor; but there are other negative aspects as well: This is only a one-way means of communication, and there is no way to assure its reception. Moreover, it can be a very dubious blessing. In one instance, schools received, by public radio, instructions pertaining to examinations; they then prepared the relevant documents in accordance with the radio instructions and sent them to the district directorate, before receiving the official circular giving the form in which the documents were to be prepared. As a result, the documents were prepared incorrectly and had to be re-done, again causing a waste of time and effort.

Thus, at this level also, the system is slow, unreliable, and inefficient, entailing an enormous amount of waste. The inefficiency -- which is often due to the lack of financial, material, and human resources -- in turn begets the waste of these limited resources.

The other major aspect of communication problems on this level is the difficulty encountered by supervisors in finding transportation, so that they can visit the schools under their direction, and the financial difficulties which they have when they make such visits. (It must be noted that -- in these instances -- the problems faced by rural supervisors are infinitely greater than those of urban supervisors.)

Unless he is fortunate enough to own a private vehicle or have access to a vehicle owned by the district directorate (and this is seldom the case), the supervisor is forced to use whatever means are available, when he needs to perform official travel -- and these means are erratic and inadequate. Normally, he takes a bus or truck up to a point, then goes the rest of the way to a given school by horse/burro and/or on foot. Travel time alone can take up to 20% to 35% of the total time in any given trip, thus seriously diminishing the amount of time available for supervisory functions. Additionally, the supervisor must typically pay for his expenses from his own pocket. In some instances -- and these, unfortunately, are very few -- he receives a very limited amount of reimbursement for travel expenses from the district directorate, and his living expenses are partially offset by aid from "padres de familia" organizations in the locales which he visits. But, always, the greater portion of his expenses are the responsibility and burden of the individual supervisor.

The effect of these problems -- transportation difficulties and personal expenses -- is, as one may well expect, a reduction in the number of trips which the supervisor makes. Nearby, easily accesible schools are visited with disproportionate frequency, while those which are distant and inaccessible are very seldom visited. This constitutes another example of the relative deprivation of education (and educators) in rural areas: The farther away a school/nucleo is from an urban center, the less it receives in terms of educational services. A side effect of the general state of affairs -- concomitant with the perceived deprivation -- is a feeling of isolation in the nucleos and seccionales and in the more distant urban schools. Essentially, their contacts with the district directorate consist of an occasional trip by a school/nucleo director or a teacher to the district capital, the infrequent visit of a supervisor, the reception of written communications, and the periodical meetings (typically, once or twice a year) of school/nucleo directors called by the district directorate. These isolated educators have virtually no contact with their colleagues in other educational institutions within the district; and they have no continual, rapid, reliable contact with the district directorate.

5.4 Within Schools and Nucleos

There seems to be no major problem at this level. Communications received from the district directorate are typically made known through service orders distributed within the school, or during staff meetings. In many instances, these staff meetings are fixed and regular, giving teachers a greater opportunity to know what is going on in the school/nucleo and in the district, and -- indirectly -- a greater participative role in the functioning of their school. Additionally, there are irregular meetings between the director and individual teachers, and the teachers -- individually or as a group -- have the opportunity to solicit a meeting with the director. The only obvious, potential communications problems within a school/nucleo would stem from the personality of the director; this, however, is outside the scope of the present report.

5.5 Between Nucleos and Seccionales

Usually, a nucleo director will call a general meeting of the teachers in his seccionales once or twice a year, to give instructions and provide orientation. Periodically, the director will visit the seccionales under his direction; here, again, the problem of transportation is critical, particularly if there is some urgent need for the director's presence. He is severely limited by the availability of transportation, traveling by truck, horse/ burro, or on foot -- again losing considerable time in travel. The director receives a minuscule reimbursement for travel expenses; in essence, he pays these expenses from his own pocket. As in the case of the supervisor, the effect is a reduction in the number of visits which the directors make.

When a written communication is received from the district directorate, it typically is recopied by hand for distribution to the seccionales, then sent by truck or traveler, on the basis of availability. In one district -- Chuquisaca -- however, a formal system does exist: a modified form of the Inca "chaki" system. The "Juntas de Auxilio Escolar", formed of campesino "padres de familia", voluntarily carry the "correo escolar". Traveling by night, they deliver messages to the seccionales (usually within a few hours after its dispatch from the nucleo), then return to their farms. The system works quite well and is reliable, although it obviously entails some problems. The time loss to the campesino "runners" is considerable, and -- though the campesinos take great pride in their efforts -- the nucleo director must be able to gain their confidence and convince them of the importance and necessity of their contribution.

In reality, an optimal use of minimal resources is made at this level. The communications system, at least, is made to work, despite the difficulties. Nevertheless, the feeling of deprivation and isolation -- referred to earlier -- is very real, and it diminishes over-all educational effectiveness and morale.

5.6 This discussion would not be complete without a commentary on communications at the Ministerial Level itself. Ironically, this is one of the weakest links in the chain. The fact that ministerial dependencies are spread out among several buildings; the abysmally poor quality (and the inadequacy) of the telephone system; the need to travel from one ministerial installation to another in order to make contact with someone; the fact that high-level functionaries are seldom in their offices; the absence of regular intra- and inter-departmental staff meetings; the totally chaotic manner in which department heads allow public audiences; the dependence upon informal and irregular contacts for getting and giving information vital to the functioning of the Ministry and educational system in general; the basic inadequacy of the Ministry's current system of correspondence control -- all these factors undermine administrative efficiency and contribute to an enormous waste of time and other resources.

In most instances, the solutions are obvious, and they are discussed in the following sections. But, the fact that they are obvious does not make them simple or palatable. It is at the Ministerial Level that waste, inefficiency, and general chaos are the greatest, and it is at the Ministerial Level that the greatest amount of operational and psychological change is required. Modifications simply must be made in the way people perform their jobs and in the way they view their functions and responsibilities. The Ministry directs the educational system; without efficiency at this level, there can be no hope for an effective system.

6.0 APPENDICES

6.1 Samples of the 5 descriptive documents used in the study describing the present communication/information system.

MINISTRY OF EDUCATION AND CULTURE

NOTES:

Organization Chart

Resource Sheet

Study . . . . . .
. . . .
Date. . . . . . .
Analyst . . . . .
. . . .

NOTES:

Activity: Personnel Equipment Material Other											
Activity: Personnel Equipment Material Other											
Activity: Personnel Equipment Material Other											

MINISTRY OF EDUCATION AND CULTURE

FLOW DIAGRAM

REFERENCES:

1 - 999	Operations
1000 - 1999	Notes
2000 - 2999	Inputs
3000 - 3999	Outputs
4000 - 4999	Files
5000 - 5999	

ORGANIZATIONAL COMPONENTS:

NOTES:

ACTIVITY:

Study . . . .
. . . .
Date. . . . .
Analyst . . . .
. . . .

MINISTRY OF EDUCATION AND CULTURE

Operation Sheet

OPERATION		TRIGGERS: INPUTS AND OUTPUTS						PROCESSES			RESOURCES				
N°	Performed by	ID N°	Name and Qualification	Received from or sent to	Avg.	Per	Elapsed Time	ID N°	Description and Qualifications	Freq.	ID N°	Type	Unit. Time	Avg.	Per

Date Analyst Study Activity Page . . . . of . . . .

BEST COPY AVAILABLE

FILE SHEET MINISTRY OF EDUCATION AND CULTURE

File Name

File N°

Location

Storage Medium

Access Requirements

Sequenced by

How Current

Content Qualifications

Labels

Notes

C O N T E N T S

Sequence N°	Message Name	Volume		Characters per Message	Characters per File	
		Avg,	Peak		Avg.	Peak

Data

Analyst

Source

Study

Page. . . . .of. . . . .

MINISTRY OF EDUCATION AND CULTURE

MESSAGE	
Message Name	Number
Other Name Used	N° of Form.
	N° of Copies
Media	How Prepared
Operations Involved in	
Notes	

CONTENTS

N°	Data Name	Frequency	Characters	A / N	Origin

Date	Analyst	Source
Study	Page of	

6.2 MEMORANDUM

La Paz, Bolivia

February 28, 1974.

TO: RAUL E. OÑORO AMADOR, Chief of Party, San Jose Mission

FROM: MAX MEHLIS GARRET, Contract Technician in Communications

SUBJECT: Salary Preparation and Payment Procedures employed in the Urban District of Santa Cruz

Introduction.-

The payment of salaries to teachers and administrative personnel in the districts visited, (Cochabamba, Sucre and Santa Cruz) is divided in two processes. The first process consists of preparing on large sheets of paper the salaries of all personnel by schools. These are prepared by personnel in the district office, by personnel of each school or by independent persons not connected with the district office.

The second process consists of following a set procedure through various governmental organizations that review, approve the salary sheets and then provide the cash to pay the personnel. The persons who go through the set procedures with the salary sheets are the same as those indicated in the first process.

Present Situation.-

The payment of salaries to teachers and administrative personnel in the urban district of Santa Cruz is essentially the same as indicated in the introduction, but with the following variations:

In the district office there are two persons with the job title of Habilitado who prepare the salary sheets for the personnel of the district office and for 22 schools. These same persons go through the second process with the salary sheets, after which they pay, in cash, the respective personnel. However, one of these Habilitados charges the personel (183 persons) of the 22 schools a monthly fee of $b. 6.00 each to prepare and process the monthly salary sheets that terminate in payment of salary. The monthly fee that this Habilitado receives is approximately $b. 1.098; from this, the Habilitado purchases the paper and carbons used in preparing the monthly salary sheets. The personnel in the ramaining schools of the district have contracted independent habilitados who are not connected with the district office to prepare and process their monthly salary sheets. The total monthly fee these independent habilitados receive is approximately $b. 94.900. They number about 8-10 persons and charge an average of 2% per month per teacher for the service rendered. The independent habilitados handle about 3.650 teachers per month of 420 schools in the district. The average monthly teachers salary is $b. 1.300 before deductions; from this the habilitado receives 2% or $b. 26 per month per teacher.

In addition, the independent habilitados help themselves to the teachers salary in various ways, as follows:

1. If the teachers net salary is say $b. 815.00 they give him only $b. 800, pocketing the remainder. The teacher does not know what is due him because the habilitado does not allow him to see the salary sheet. This is a very common practice.

2. In many cases the habilitado only gives the teacher a small portion of his salary, like $b. 200 citing non-existant deductions, etc. In some cases the teacher has complained to the district office, but unfortunately has had no backing.

In this situation are also some school directors who recommend the independent habilitados to the teachers. They have no alternative, so the school director also receives a portion of the 1 1/2 to 3% or more charged by the habilitado.

This situation has developed because the school secretary-habilitado has given up this particular task of their job. In other districts they prepare and process the salary sheets independently or jointly through the district office. The teachers in this case are charged for the paper and carbons used, which amounts to $b. 1.50-2.00 per month per person.

Recommended Solution.-

To improve and remedy the present situation it is recommended that the preparation of all school salary sheets be done on the computer of the Comitê de Obras Públicas. Theestimated monthly operating costs for this portion of the salary process is as follows:

1.	Computer time: 2 Hrs/mo.	$b. 1.000
2.	Keypunch cards: 1000/mo.	40
3.	Keypunch and verify: 2000 cards/mo.	800
4.	Continuous paper 735 sheets of 6 part paper	1.470
		$b. 3.310
5.	20% for contingencies	660
	Total Cost per month	$b. 3.970

Over time, this could be lowered to approximately $b. 3.000 per month. The teachers could pay for this by deducting $b. 1 per month each.

The second portion of the process may be handled by the habilitados in the district office at no additional cost to the teacher.

To process the salary sheets on the computer shall require a maximum initial one-time cost of $b. 30.000. This cost would be for the following items:

1. Purchase of one magnetic disk - cost $b. 4.000
2. Program development; includes computer time cost for debugging.
3. Master file creation; includes keypunch and verifying of data.

4. Materials
5. System analysis and design.

Conclusions.-

Processing all salary sheets on the computer of the Comité de Obras Públicas reduces the monthly cost from $b. 26 to $b. 1 for the teachers. It also eliminates the shake-down practices of the independent habilitados and returns control of the salary sheets to the district office.

As part of the salary sheet preparation on the computers, the preparation of individual teachers checks may be provided. This eliminates handling of large amounts of cash by the habilitados, which in the past recently has caused more than one habilitado to run-off with the teachers' salaries.

Part II: Requirements of the Communications/Information System

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    - 7.2.3 Required Operations
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- 9.0 Additional Comments: Strengthening the Communication Chain
  - 9.1 Ministerial Level
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  - 9.3 Within the District Directorate
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1.0 SUMMARY

1.1 Introduction

This second part of our report presents the Communications/ Information System Requirements on an activity-by-activity basis. The activities presented in this report constitute the basic ones which make up the system. They are the result of a realignment and synthesis of all the activities identified in Part I, Present Communication/Information System Description.

The requirements of each activity in this report are in terms of the inputs it must accept, the operations it must perform, the outputs which must be produced, and the resources which must be employed. The requirements resulting from the activity analysis and synthesis have been determined, using an Activity Requirements Model as a framework. The general model structure is given in Figure 1.1. For each activity, the inputs and outputs are first determined, since they are normally more closely associated with the goals and objectives of the activity. After specifying inputs or outputs, a logical sequence of required operations is established for activity performance. As these relationships are defined, the required resources emerge to complete the activity requirements.

ACTIVITY REQUIREMENTS MODEL

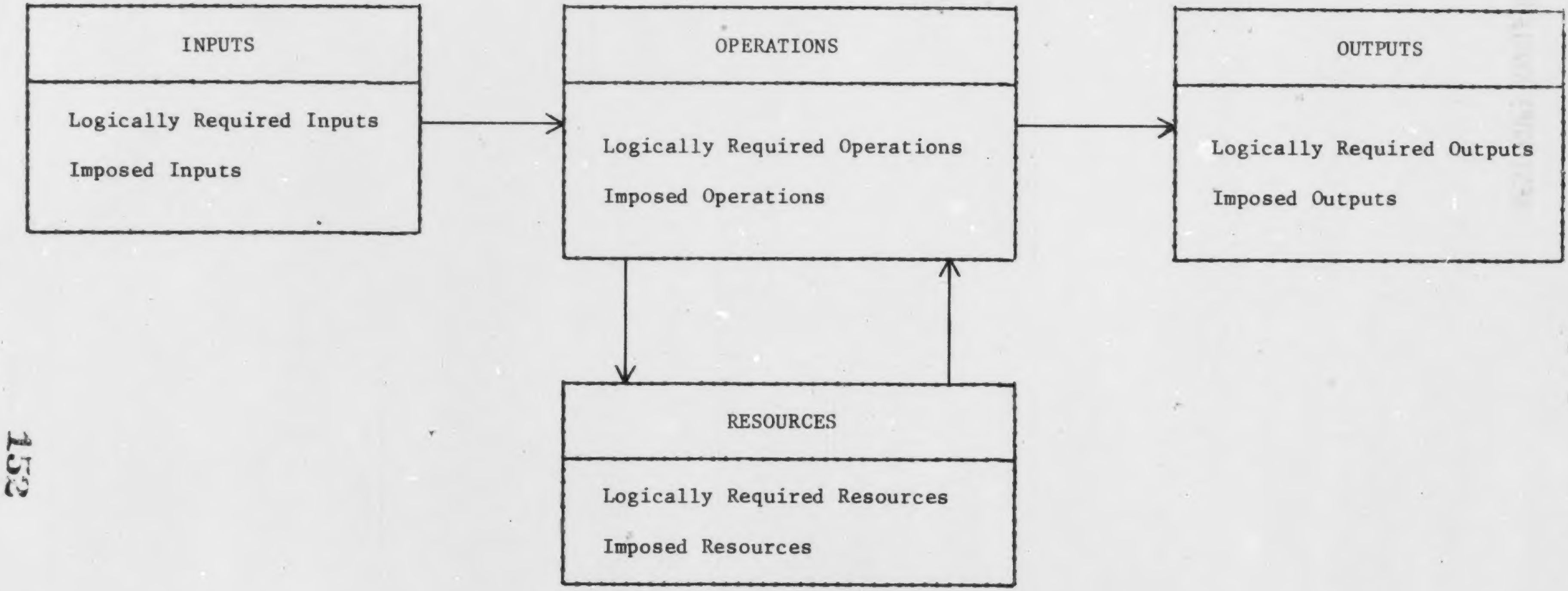

INPUTS
Logically Required Inputs
Imposed Inputs
OPERATIONS
Logically Required Operations
Imposed Operations
OUTPUTS
Logically Required Outputs
Imposed Outputs
RESOURCES
Logically Required Resources
Imposed Resources

FIGURE 1.1

The requirements of each activity are described and documented through the use of three forms. The forms are as follows and each one is briefly described:

- Input-Output Sheet
- Required Operation Sheet
- Resource Sheet

1.1.1 Input-Output Sheet records the required characteristics of inputs and outputs. A sample of the form is given in Figure 1.1.1.1. The key numbers in the form columns describe the respective headings and are given on the page following the form.

1.1.2 Required Operations Sheet summarizes the input and output factors and frequency of execution of each required operation. A narrative description of the operation, describing what the operation does, is entered on this form. A sample of the form is given in Figure 1.1.2.1. The key numbers in the form columns describe the respective headings and are given on the page following the form.

1.1.3 Resource Sheet summarizes the physical and informational resources required by the activity. A sample of the form is given in Figure 1.1.3.1. The key numbers in the form columns describe the respective headings and are given on the page following the form.

The stress of this Part II is on the results the system must achieve.

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
1		2	3	4	5	6	

Note: For key number description of headings, see following page.

Date: Analyst: Activity:

Study: Page of

FIGURE 1.1.1.1

Input-Output Sheet - Key number description

1. No.: The identification number serves the purpose of reference and separates inputs from outputs. Inputs are identified with the prefix E, outputs by the prefix S.

2. Rate: This figure characterizes arrival or departure frequency of the item in terms of volume for some unit of time. Typical entries are 10 per day, 1 per year; the figures reflect projected rates determined through the analysis work.

3. Medium: This specifies the means by which the input or output is represented. In the case of this report, most of the entries indicate "open". This means that the medium is open for design or redesign during system implementation. When the entry "set form" or "set formal" is given, this means that the design is determined in format and/or content.

4. Source/Destination: This pertains to sources of inputs and destinations of outputs which are outside of the activity under scrutiny.

5. No. of Fields: This represents the average number of data fields on the document being described.

6. No. of Characters: This represents the average size of the message, document or fields, measured in characters. This will be determined during system implementation.

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEET

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
1	2	3	4	5

Note: For key number discription of headings, see following page.

Date:

Analyst:

Activity:

Study:

Page of

FIGURE 1.1.2.1

Required Operations Sheet - Key number description

1. No.: An identification number -- which begins with the prefix 0 -- is assigned to each operation.
2. Operation Name: A descriptive name is given to each operation to describe either what the operation does or its end product. Included is a description of what the operation does.
3. Input Factors: This gives the total number of data fields in all input items used in the operation.
4. Output Factors: This gives the total number of data fields in all output items produced by the operation.
5. Frequency of Execution: This is determined by analysis. A convenient time span is selected, and the total number of executions for the time span period is given.

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET

N°	Name and Description	Amount	Cost $US	Notes
1	2	3	4	5

Note: For key number descriptions of headings, see following page.

Date: Analyst: Activity:

Study: Page of

FIGURE 1.1.3.1

Resource Sheet - Key number description

1. No.: An identification number -- which begins with the prefix R -- is assigned to each resource used in the activity.
2. Name and Description: The name represents what the resource is, as well as characteristics which help identify it. Personnel are described by occupational specialty.
3. Amount: This is represented by a number -- people, pieces of equipment, etc.
4. Cost: Either cost per unit/time or cost per unit is given.

1.2 Goals and Objectives

The principal goal and objective of the Communications/Information System for the Bolivian educational system is to unify information sources in providing accurate, timely, and useful information for operating, planning, and policymaking purposes of the Ministry of Education.

The unification of information sources and data will allow the rural and urban district personnel to devote more of their time to technical-pedagogical activities.

Through the provision of useful and centralized information at the national level (Ministry of Education), planners and operating personnel will have at their disposal informational tools which will allow them to carry out their functions in a more effective and knowledgeable manner.

The purpose of this report is to specify the information which is needed for an optimal functioning of the system and the best methods for handling the information.

1.3 General Considerations

To achieve the stated goals and objectives, the Communications/Information System must consider some form of mechanization to handle the large amounts of data generated by the sources. These large amounts of data require editing, summarizing and combining, in order to convert them into useful information. As a final step, the information needs to be distributed to the appropriate users at both the national and district levels. This may be accomplished through the use of data terminals. The terminals can include keyboards for data input, inquiries, and messages; a video screen for data verification, responses, and messages; and a printer for data output.

Through the use of mechanization, the system may be decentralized to the district level and, at the same time, be centralized at the national level.

1.4 Activity Definitions and Interrelationships

To determine the system requirements, the activities identified in the analysis of the present Communications/Information System, have been realigned and synthesized into a few basic activities. These basic activities are identified as follows:

1.4.1 Salaries
1.4.2 Personnel
1.4.3 Assets
1.4.4 Inventory and Distribution
1.4.5 Budget Control
1.4.6 Information
1.4.7 Printing

The first three activities, aside from performing their specific functions, also provide inherently specialized information. They operate and function at the district and national levels and have been decentralized in their operational aspects.

The fourth activity, Inventory and Distribution, operates and functions at the national level only. It combines several inventory functions into the one activity.

The fifth activity, Budget Control, operates and functions at the national level only.

The sixth activity, Information, is the tie between all the activities. At the district level, the information from the applicable activities is centralized and accessible to the district only. This activity at the national level has access to each and all the districts' activity information, as well as to all activity information available only at the national level.

The last activity, Printing, refers to the printing installations at the national level.

The activities are described and defined in terms of their goals and objectives, scope and boundary, and related considerations. These aspects are described for each activity as a whole, without separating it into national or district levels. This is because these aspects are the same, regardless of the place or level of application. Some activities are applicable at the national level only -- ergo, Inventory and Distribution, Budget Control and Printing.

The activity requirements are determined at both national and district levels, but separately. The separation reflects the different functions performed by the national and district levels; these are described below. The national level essentially sets policies and guidelines and plans educational direction. To perform this function, it requires operational and implementation data which comes from the districts. The district level puts into motion and practice, and implements the policies and educational plans generated by the national level. The data which it provides to the national level must reflect the implementation. The new Communications/Information System must provide the data requirements for both levels, if they are to fulfill their functions.

The system requirements for the district level are determined for one departmental district, which includes rural and urban areas. The requirements are the result of the communications/information analysis performed in the districts of Cochabamba, Chuquisaca and Santa Cruz. The analysis shows that identical data is generated by the three districts, even though the forms and formats may be somewhat different. Also, the data destination -- the national level -- is identical, as is the time of the year when it is sent. The analysis of the national level departments which receive the district data shows that it is approximately 90% identical in all nine departmental districts, as well as for the regional and zonal supervisory offices.

It is on the basis of the above that the system requirements for the nine departmental districts are given by one representative district, which is the combination of the three analyzed.

2.0 ACTIVITY - SALARIES

2.1 General

2.1.1 Goals and Objectives

This activity shall prepare salaries for all personnel in the Bolivian educational system, which number over 43,000 persons. A file shall be maintained and updated containing relevant information. It shall also provide applicable salary data to government agencies which require it.

2.1.2 Scope and Boundary

Salary activities shall range from reception of respective documents and pertinent information to the distribution of payment vouchers to personnel. In the districts, the SIDA office shall handle and perform this activity for all administrative and teacher personnel in the district.

At the national level, the salary activity shall be handled and performed by the Salary Department. This department shall be responsible for implementing salary policy and pay scales at the national and district levels.

The districts shall have access to their salary files only. The Salary Department shall have access to any and all district and national level salary files.

2.1.3 General Considerations

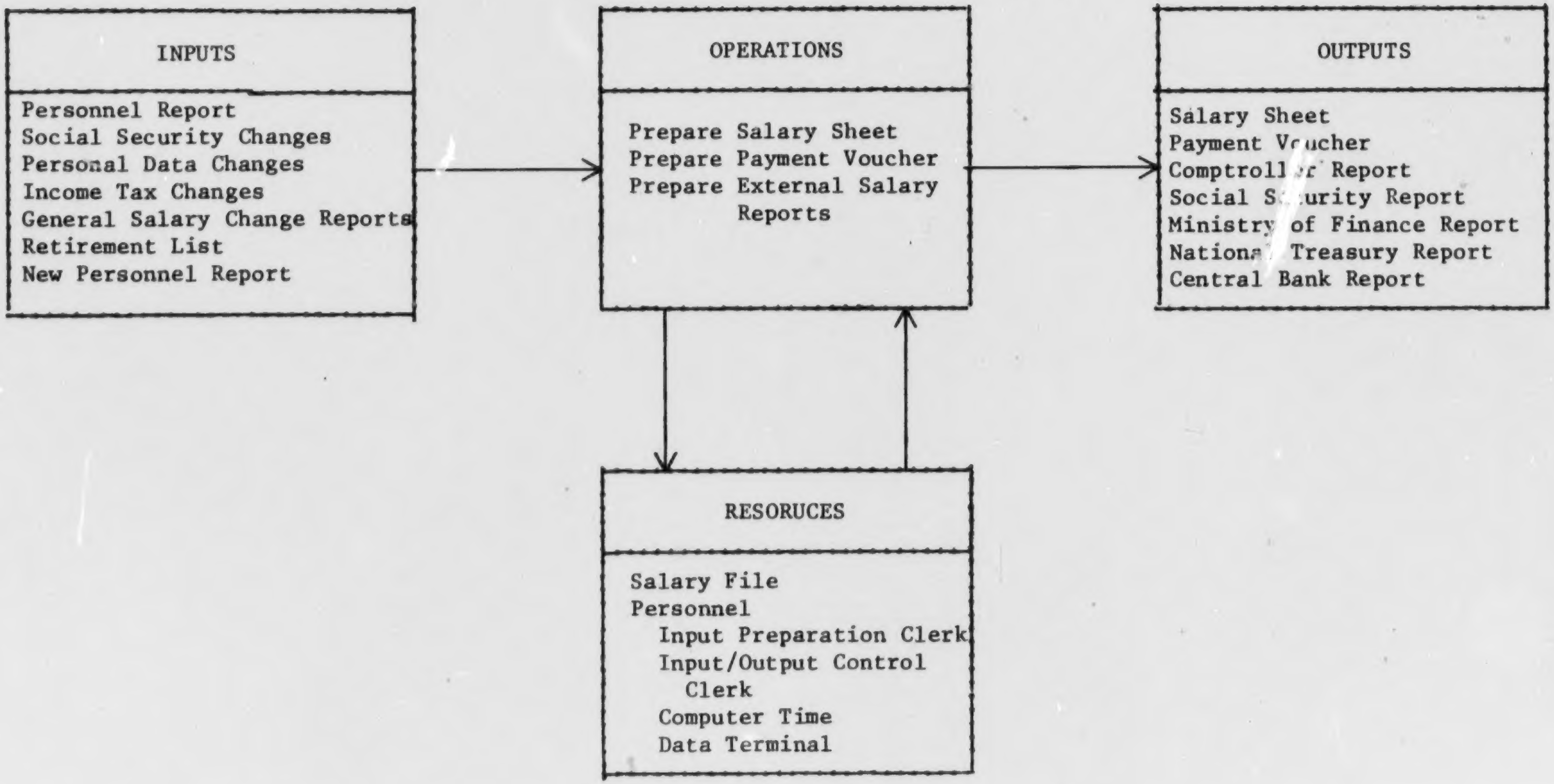
All salary activities performed by schools and independent persons shall be transferred to the SIDA offices in the districts. At the national level, all salary activities shall be centralized in the Salary Department.

2.2 OPERATIONS

2.2.1

SALARY REQUIREMENTS MODEL

NATIONAL LEVEL


INPUTS
Personnel Report
Social Security Changes
Personal Data Changes
Income Tax Changes
General Salary Change Reports
Retirement List
New Personnel Report
OPERATIONS
Prepare Salary Sheet
Prepare Payment Voucher
Prepare External Salary Reports
OUTPUTS
Salary Sheet
Payment Voucher
Comptroller Report
Social Security Report
Ministry of Finance Report
National Treasury Report
Central Bank Report
RESORUCES
Salary File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE

INPUT - OUTPUT SHEET 2.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Personnel Report	1/mo.	open	Depts. & Offices			
	Attendance	300/mo.	open		4		Lateness, absences and abandonment
	identification				2		Personnel Office or dept.
	location				2		
	Deceased	6/yr.	open				
	identification				2		
	location				2		
	Vacated	18/yr.	open				
	identification				2		
	location				2		
	Transfers	10/mo.	open				
	identification				2		
	location				2		
	salary				24		
	Salary changes	86/mo.	open		24		On-the-job personnel
	identification				2		
	location				2		
E2	Social Security changes	76/mo.	set form	CNSS	9		Benefits
E3	Personal Data Changes	5/mo.	set form	Renta	6		
E4	Income Tax changes	5/mo.	set form	Renta	5		
E5	General Salary Change Reports	random	variable	Govt.	5		
E6	Retirement List	1/yr.	open	Personnel			6 persons per year
	identification				2		
	location				2		

Date:

Analyst: M. Mehlis

Activity: Salaries

Study: Ministry of Education

Page 1 of 2

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MINISTRY OF EDUCATION AND CULTURE   INPUT - OUTPUT SHEET 2.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E7	New Personnel Report	30/yr.	open	Minister or Personnel Dept.			
	identification		open		2		
	location				2		
	salary				24		
S1	Salary Sheet	1/mo.	open	Salary Dept.			
	identification				2		630 persons
	location				2		75 offices
	income items				14		
	deduction items				10		
S2	Payment Voucher	1/mo.	open	Personnel	17		630 persons
S3	Comptroller	1/mo.	set data	Comptroller			
S4	Social Security	1/mo.	set data	CNSS	7 per person		For 630 persons; deductions and benefits
S5	Ministry of Finance Report	1/mo.	set data	Min. Finance			
S6	National Treasury Report	1/mo.	set data	National Treasury			
S7	Central Bank Report	1/mo.	set data	Central Bank	6 per person		For 630 persons

Date: Analyst: M. Mehlis   Activity: Salaries

Study: Ministry of Education   Page 2 of 2

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEET 2.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Salary Sheet A salary sheet is prepared for all the personnel of the Ministry of Education. It shows all income and deduction items, as well as personnel identification items and location items.	30	630	1/month
02	Prepare Payment Voucher A payment voucher is prepared for each employee of the Ministry of Education. It shows only legally required deductions and personnel identification items.	17	630	1/month
03	Prepare External Salary Reports Salary reports are prepared for governmental agencies which require them. The reports contain the pertinent and required data.	5	---	1/month

Date: Analyst: M. Mehlis Activity: Salaries

Study: Ministry of Education Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 2.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Salary File	1	630/yr.	Ministry personnel only
R2	Input Preparation Clerk	1	60/mo.	
R3	Input/Output Control Clerk	1	60/mo.	
R4	Computer Time		40/hr.	New CENACO computer
	(At this point, it is impractical to estimate hours of usage.)			
R5	Data Terminal with Keyboard and Printer	1	6,500	Purchase

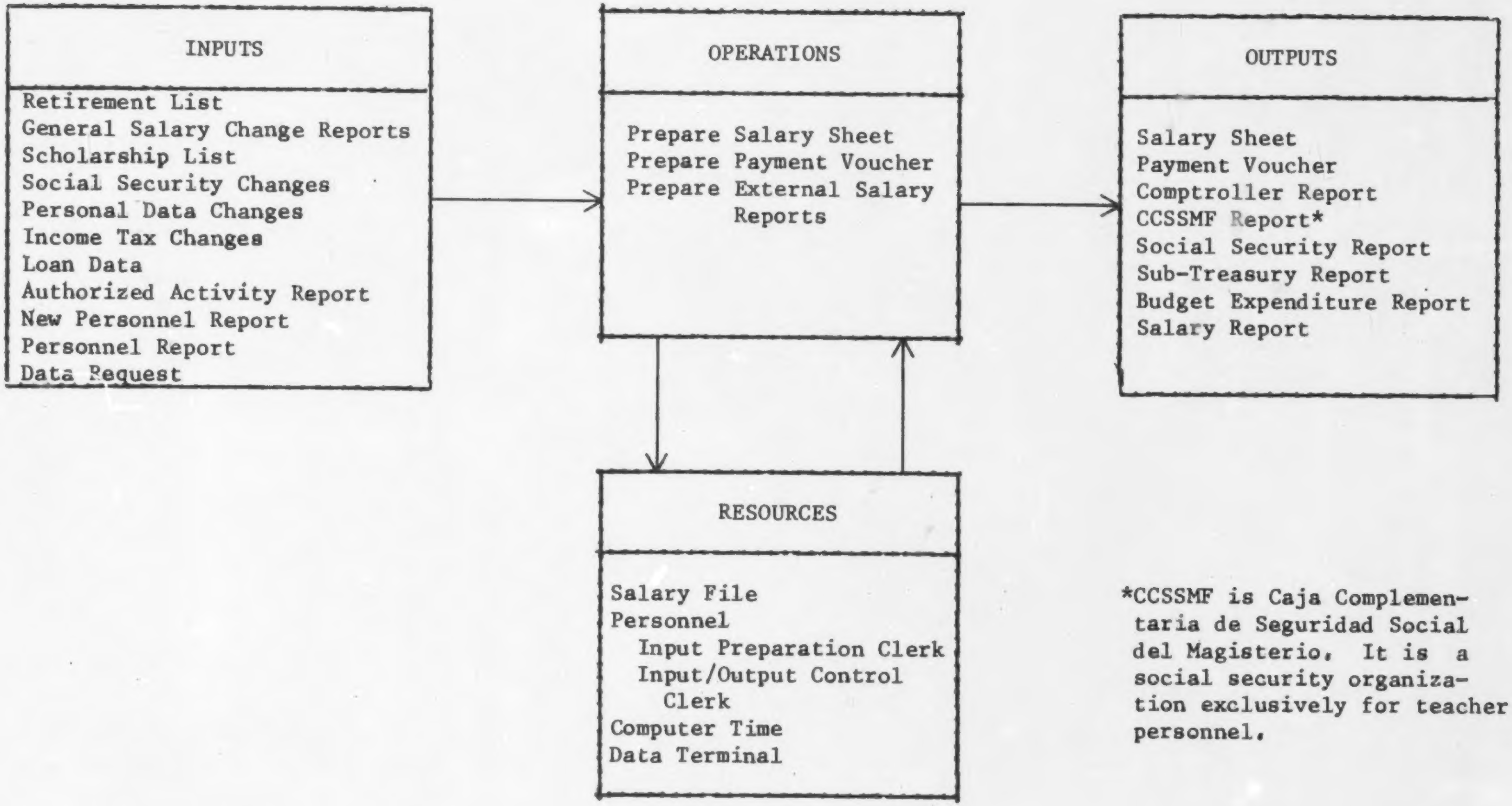
Date: Analyst: M. Mehlis Activity: Salaries

Study: Ministry of Education Page 1 of 1

2.2.1

SALARY REQUIREMENTS MODEL

DISTRICT LEVEL



INPUTS

- Retirement List
- General Salary Change Reports
- Scholarship List
- Social Security Changes
- Personal Data Changes
- Income Tax Changes
- Loan Data
- Authorized Activity Report
- New Personnel Report
- Personnel Report
- Data Request

OPERATIONS

- Prepare Salary Sheet
- Prepare Payment Voucher
- Prepare External Salary Reports

OUTPUTS

- Salary Sheet
- Payment Voucher
- Comptroller Report
- CCSSMF Report*
- Social Security Report
- Sub-Treasury Report
- Budget Expenditure Report
- Salary Report

RESOURCES

- Salary File
- Personnel
  - Input Preparation Clerk
  - Input/Output Control Clerk
- Computer Time
- Data Terminal

*CCSSMF is Caja Complementaria de Seguridad Social del Magisterio. It is a social security organization exclusively for teacher personnel.

MINISTRY OF EDUCATION AND CULTURE   INPUT - OUTPUT SHEET 2.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Retirement List	1/yr.	open	SIDA			44 persons per year
	identification				2		
	location				3		
E2	General Salary Change Reports	random	variable	national level	5		
E3	Scholarship List	1/yr.	open	national			600 persons in La Paz;
	identification			level	2		
	location				3		400 persons in Sucre and Santa Cruz
E4	Social Security changes	560/mo.	set form	CNSS	9		
E5	Personal Data	15/mo.	set				
	changes		form	Renta	6		
E6	Income Tax changes	15/mo.	set form	Renta	5		
E7	Loan Data	20 pers.		CCSSMF	6		
		/mo.	open				
E8	Loan Data	25 pers.		CONAVI	6		
		/mo.	open				
E9	Authorized	1/yr.	open	National			
	Activity Report			level			For 845 schools
	hours				10		
	classes				10		
	personnel				10		
	grades				10		
E10	New Personnel	295/yr.	open	District			
	Report			Offices			
	identification data			and	2		
	location			SIDA	3		
	salary data				24		
E11	Personnel Report	1/mo.	open	Schools &			
	Deceased Personnel	51/yr.		District			
	identification			Offices	2		51 persons/yr.
	location				3		
	Vacated Personnel	200/yr.	open				200 person/yr.
	identification				2		
	location				3		

Date: Analyst: M. Mehlis   Activity: Salaries

Study: Department Rural and Urban District   Page 1 of 2 pages

MINISTRY OF EDUCATION AND CULTURE INPUT -OUTPUT SHEETS 2.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
	Transfers	unknown	open				
	identification				2		
	location				3		
	salary				24		
	Salary changes	unknown	open		24		
	identification				2		
	location				3		
	Attendance	2,000/mo.	open		4		Lateness, absence & abandonment; 2,000 persons/mo.
	identification				2		
	location				3		
E12	Data Request	unknown	open	SIDA	5		
S1	Salary Sheet	1/mo.	open	SIDA			For 5,093 persons, 845 schools
	identification				2		
	location				3		
	income items				12		
	deduction items				10		
S2	Payment Voucher	1/mo.	open	Personnel	17		5,093 persons
S3	Comptroller Report	1/mo.	set data	Comptroller			
S4	CCSSMF Report	1/mo.	open	CCSSMF			Loans
S5	CCSSMF Report	1/mo.	set	CCSSMF			Deductions
S6	Social Security Report	1/mo.	set data	CNSS	7 per person		Deductions & benefits; 5,093 persons
S7	Sub-treasury	1/mo.	set data	Sub-Treasury			
S8	Budget Expenditure Report	1/mo.	open	SIDA			By accounts
S9	Salary Report	unknown	open	SIDA District Offices	27		

Date: Analyst: M. Mehlis Activity: Salaries

Study: Departmental Rural and Urban District Page 2 of 2

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEETS 2.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Salary Sheet A Salary sheet is prepared for all the teacher and admin. personnel in the district. It is prepared by school. The following average figures are used for a typical departmental district: 5,072 personnel (teacher & admin.) 845 schools	38	5,093	once/month
02	Prepare Payment Voucher A payment voucher is prepared for each employee in the district. It shows only legally required deductions and personnel identification items.	17	5,093	once/month
03	Prepare External Salary Report Salary reports are prepared for governmental agencies which require them. The reports contain the pertinent and required data.	4	--	once/month

Date: Analyst: M. Mehlis Activity: Salaries

Study: Departmental Rural and Urban District Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE

RESOURCE SHEET 2.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Salary File	1	5,093/yr.	District personnel only
R2	Input Preparation Clerk	2	100/mo.	
R3	Input/Output Control Clerk	2	100/mo.	
R4	Computer Time (At this point, it is impractical to estimate hours of usage.)		50/hr.	New CENACO computer
R5	Data Terminal with Keyboard and Printer	1	25,000	Purchase

Date:

Analyst: M. Mehlis

Activity: Salaries

Study: Departmental Rural and Urban District

Page 1 of 1

3.0 ACTIVITY - PERSONNEL

3.1 General

3.1.1 Goals and Objectives

This activity shall maintain a permanent record for over 43,000 persons in the educational system. It shall continuously update the records and provide information to personnel for certification purposes. It shall handle all personnel matters.

3.1.2 Scope and Boundary

Personnel records shall be maintained in a file and contain certified and non-certified data. Certified data shall be marked, to differentiate it from non-certified data. Non-certified data becomes certified data when personnel provide or present the respective certificate.

Personnel records shall include the following data:

- Identification
- Personal
- Professional
- Service and/or
- Work

The SIDA district offices in the interior shall handle all personnel matters within the district. This shall include issuing certificates for inscriptions, service time, category, titles and studies. Certificates for studies abroad shall be issued at the national level. The SIDA office has the responsibility of implementing and enforcing personnel policy and practice in the district; it shall have access to the district personnel file only.

At the national level, the personnel activity shall be handled and performed by the Personnel Department. This department shall be responsible for implementing and enforcing personnel policy and practice at the national and district levels. The department shall have access to any and all district and national level personnel files. The personnel files shall contain deceased, retired, vacated, on-the-job and in-service personnel.

3.1.3 General Considerations

The present Urban and Rural Teaching Personnel Divisions shall be combined into one department. This one department shall also incorporate the present National Department of Administrative Personnel. The respective files shall be combined into one standard file.

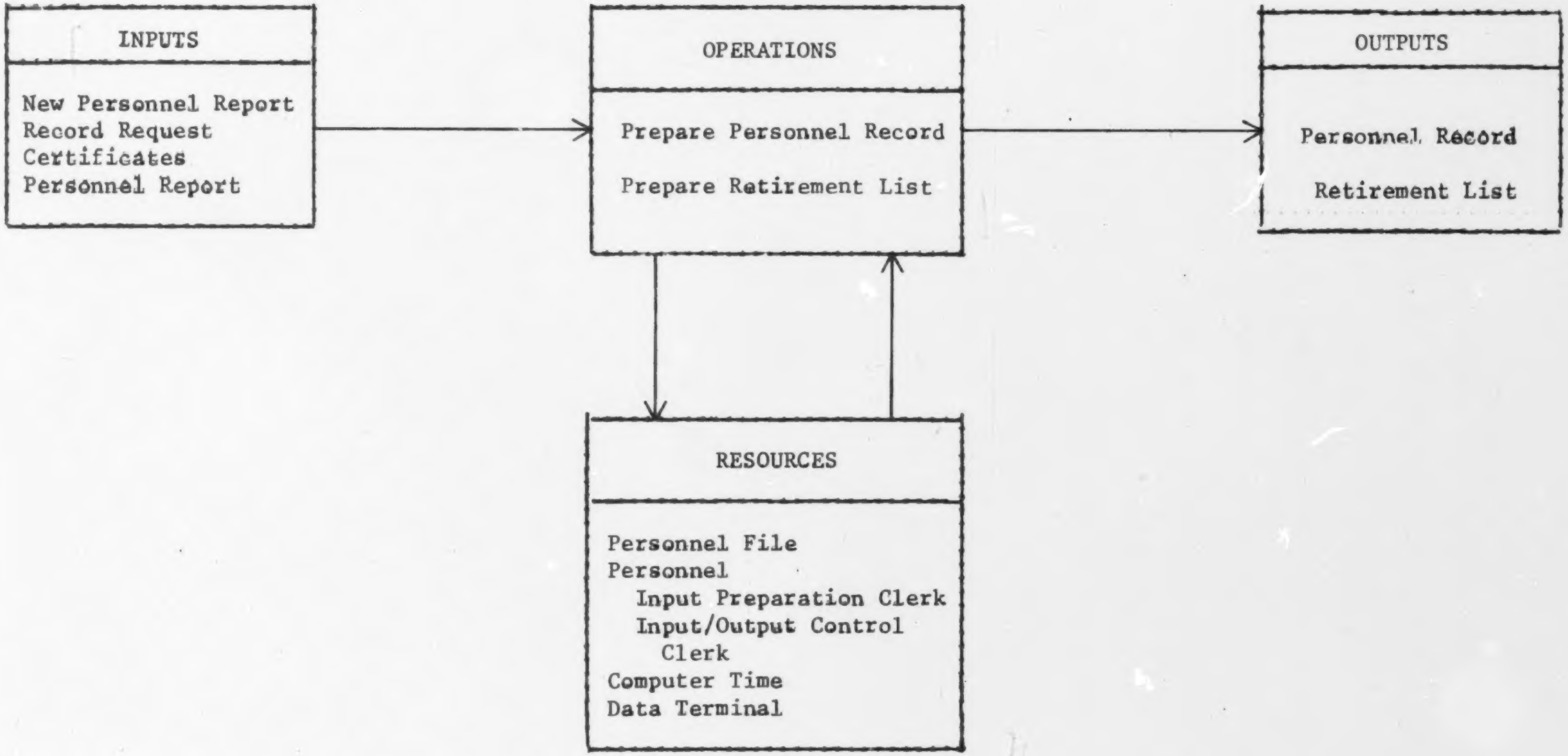
The departmental district offices shall create their own file, with the same standards as the national level file.

3.2 OPERATIONS

3.2.1.

PERSONNEL REQUIREMENTS MODEL

NATIONAL LEVEL


INPUTS
New Personnel Report
Record Request
Certificates
Personnel Report
OPERATIONS
Prepare Personnel Record
Prepare Retirement List
OUTPUTS
Personnel Record
Retirement List
RESOURCES
Personnel File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 3.2.2.

N°	Name	Rate	Medium	Source Destinat.	N° of Fields	N° of Chars.	Notes
E1	New Personnel Report	30/yr.	open	Minister or Personnel Dept.			30 persons/year
	identification		open		2		
	personal data		open		20		
	work data		open		7 per company		From curriculum vitae
	professional data		open		14		
	activity data		open		2		
	location da[illegible]		open		2		
E2	Record Request	24/yr.	open	Offices & Depts.	2		
E3	Certificates		open				
	Admin. Office	30/yr.	open	Minister	8		Min. Of Education
	commission	15/yr.	open	Minister	15		For Scholarships, trips, etc.
E3	Personnel Report On-the-Job	4/yr.	open	Depts. & Offices			For 630 persons
	identification				2		Personnel identif.
	location				2		Office or Dept.
	activity				2		Job title or work title
	Deceased	6/yr.	open	Depts. & Offices			
	identification				2		6 persons/yr.
	location				2		
	Vacated	18/yr.	open	Depts. & Offices			
	identification				2		18 persons/yr.
	location				2		
	Transfers	Unknown	open	Depts. & Offices			
	identification				2		
	activity				4		
	location				4		
S1	Personnel Record	--	open	Depts. & Offices			
	retirement Data	6/yr.	open	CNSS	10		For Social Security benefits
	professional Data		open		14		
	identification data		open		2		
	work data	18/yr.	open		10		For work certificates, etc.
	personal data	unknown	open		20		
	activity data		open		2		
	location data		open		2		
S2	Retirement List	1/yr.	open	CNSS			For 6 persons/yr.
	identification			Offices & Depts.	2		
	location				2		

Date: Analyst: M. Mehlis Activity: Personnel

Study: Ministry of Education Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEET 3.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Personnel Record	2	50	24/yr.
02	Prepare Retirement List	24	240	1/yr.

01 A personnel record is prepared upon request for managers, retired personnel, and personnel who have left the Ministry and need a work record or certificate. The 24/yr. are for retirees and personnel who have left. The number of other type inquiries is unknown.

02 A retirement list is prepared at the end of the year for managers and the CNSS. There are 6 retirements per year.

Date: Analyst: M. Mehlis Activity: Personnel

Study: Ministry of Education Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 3.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Personnel File	1	630/yr.	Ministry personnel only
R2	Input Preparation Clerk	1	60/mo.	
R3	Input/Output Control Clerk	1	60/mo.	
R4	Computer Time (At this point, it is impractical to estimate hours of usage.)		40/hr.	New CENACO computer
R5	Data Terminal with Keyboard and Printer.	1	6,500	Purchase

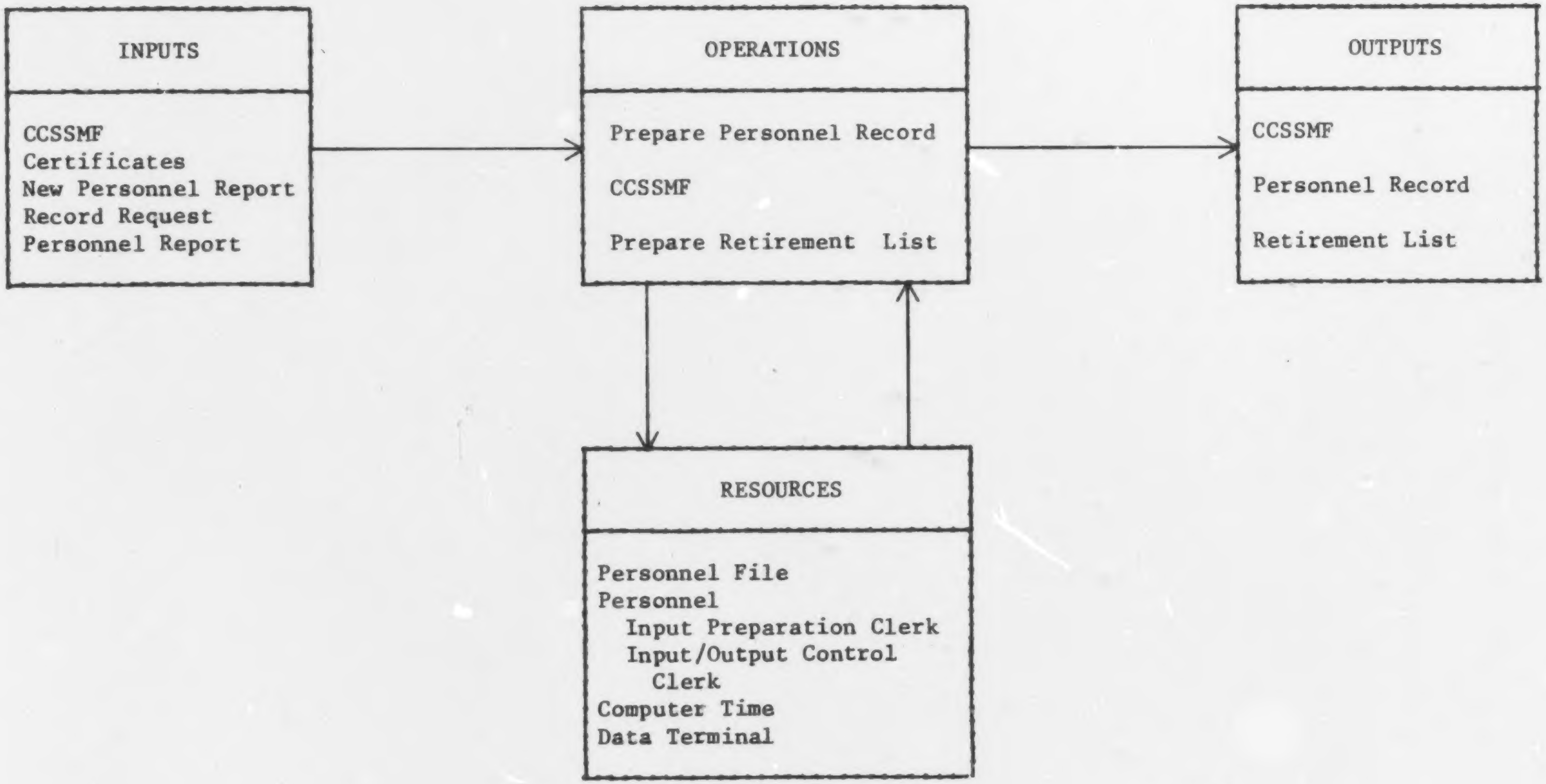
Date: Analyst: M. Mehlis Activity: Personnel

Study: Ministry of Education Page 1 of 1

3.2.1

PERSONNEL REQUIREMENTS MODEL

DISTRICT LEVEL


INPUTS
CCSSMF
Certificates
New Personnel Report
Record Request
Personnel Report
OPERATIONS
Prepare Personnel Record
CCSSMF
Prepare Retirement List
OUTPUTS
CCSSMF
Personnel Record
Retirement List
RESOURCES
Personnel File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 3.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	CCSSMF	1430/mo.	set form	CCSSMF	6		Teacher's loan application; 3 persons to be verified.
E2	Certificates	1839/yr.	open	SIDA or			
	Inscription		open	Interested			To teachers' roster
	identification		open	Party	2		
	personal		open		10		
	Category and	331/mo.	open	SIDA	15		
	Service Time	for both			8	per school	
	Studies	unknown	open	SIDA	12		Normal Schools, Institutes, etc.
	Title	unknown	open	SIDA	12		Teaching title
	Commission	unknown	open	National level	15		For scholarships, trips etc.
E3	New Personnel	295/year	open	District			
	Report		open	Offices			
	identification data		open	& SIDA	2		
	personal data		open		20		
	professional data		open		14		
	service data		open		8	per school	
E4	Record Request	5909/yr	open	District Offices; Interested Party	2		To obtain certificates
E5	Personnel Report	1/mo.	open	Schools & Offices			
	Deceased Personnel	51/yr.	open				51 persons/yr.
	identification				2		
	location				3		
	Vacated Personnel	200/yr.	open				200 persons/year
	identification				2		
	location				3		

Date: Analyst: M. Mehlis Activity: Personnel

Study: Departmental Rural and Urban District Page 1 of 2

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 3.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
S1	CCSSMF	1,430/mo.	set form	CCSSMF	6		Teacher's loan application
S2	Personnel Record		open				
	retirement data	44/yr.	open	CNSS, CCSSMF & Interested Party	10		44 persons/yr. social security benefits
	personal data	1,839/yr.	open	District Office	20		For inquiry and inscription
	category data	331/mo.	open	same	15		For category & inquiry
	professional data	1839/yr.	open	same	14 plus 8/school		For inquiry inscription & category
	service time data	331/mo.	open	same	8/school		For inquiry, inscription and category
	identification		open	same	2		
S3	Retirement List	1/yr.	open	SIDA, District Offices, CNSS			For 44 persons/yr.
	identification				2		
	location				3		

Date: Analyst: M. Mehlis Activity: Personnel

Study: Department Rural and Urban District Page 2 of 2

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEETS 3.2.3

N°	Operation Name	Input Factores	Output Factors	Frequency of Execution
01	Prepare Personnel Record A personnel record is prepared for several purposes, as follows: Obtaining certificates of inscription, category and service time; for inquiry purposes of managers, retired personnel, and personnel who have left the educational system and need a service record or certificate. The personnel record is also used for determining assignments or commissions. The 5,953 are for retired, inscription, category and vacancy Personnel Record requests per year. The number of other type inquires is unknown.	2	98	5,953/yr.
02	CCSSMF The loan application data is verified against the personnel file data on a one for one basis.	6	6	1,430/mo.
03	Prepare Retirement List A retirement list is prepared at the end of the year for managers and the CNSS. There are 44 retirements per year.	220	2,200	1/year

Date Analyst: M. Mehlis Activity: Personnel

Study: Departmental Rural and Urban District Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 3.2.4

N°	Name and Description	Amount	Cost $US	Note
R1	Personnel File	1	5,093/yr.	District personnel only
R2	Input Preparation Clerk	1	50/mo.	
R3	Input/Output Control Clerk	1	50/mo.	
R4	Computer Time (At this point, it is impractical to estimate hours of usage.)		50/hr.	New CENACO computer
R5	Data Terminal with Keyboard and Printer	1	25,000	Purchase

Date: Analyst: M. Mehlis Activity: Personnel

Study: Departmental Rural and Urban District Page 1 of 1

4.0 ACTIVITY - ASSETS

4.1 General

4.1.1 Goals and Objectives

This activity shall maintain a permanent and verified record of all assets in the entire educational system. A file containing relevant information shall be maintained and updated. It shall also provide applicable assets data to governmental agencies which require it.

4.1.2 Scope and Boundary

The activity shall verify all asset items. The items shall be buildings, their facilities and all items which are non-consumable.

In the districts, the SIDA office shall be responsible for implementing assets policy and shall have access to the assets file of the district only.

At the national level, the assets activity shall be handled and performed by the Assets Division, which shall be responsible for implementing assets policy at the national and district levels. The Assets Division shall have access to any and all district and national level assets files. The files shall include cost data.

4.1.3 General Considerations

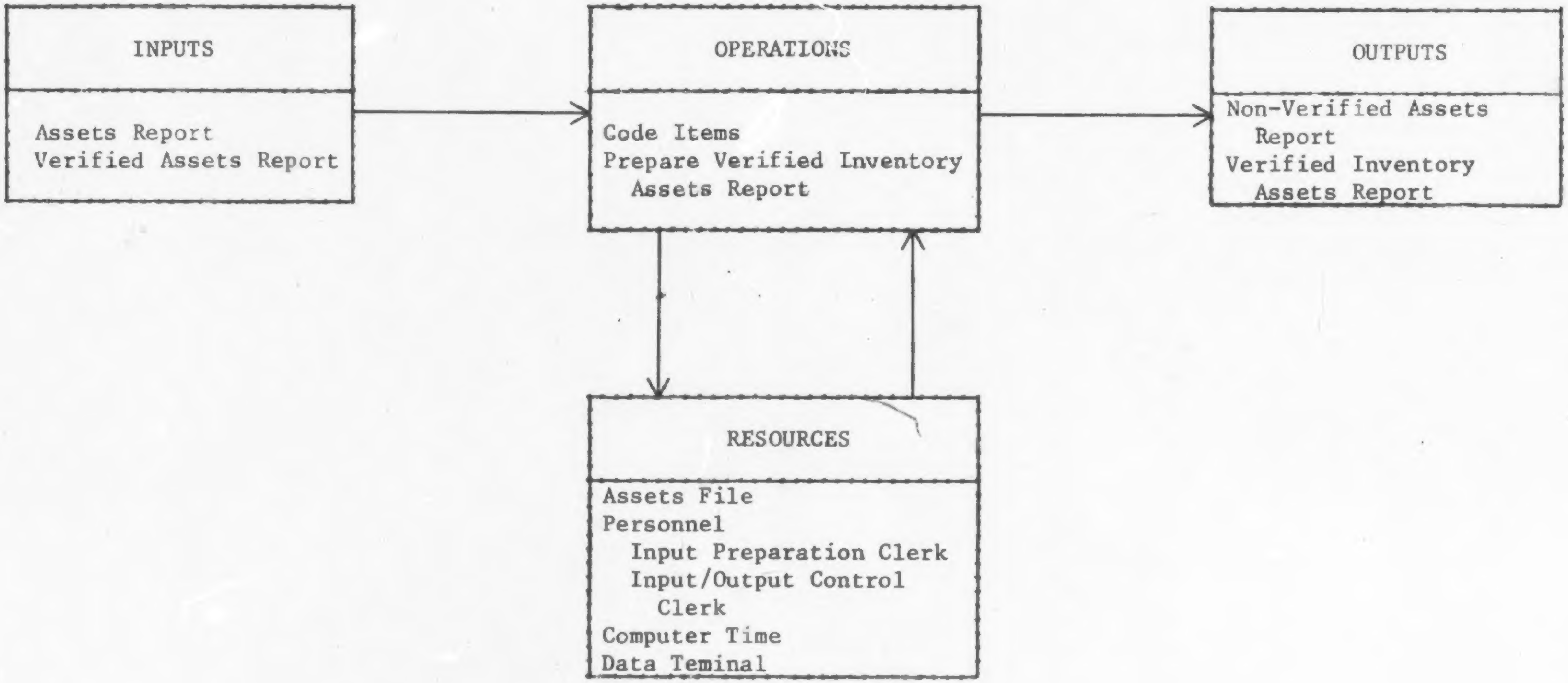
All assets at the national level shall be acquired by the Purchases and Supplies Division. The SIDA district offices shall acquire assets on their own, up to an established value. Anything over that amount shall be acquired at the national level.

4.2 OPERATIONS

4.2.1

ASSETS REQUIREMENTS MODEL

NATIONAL LEVEL


INPUTS
Assets Report
Verified Assets Report
OPERATIONS
Code Items
Prepare Verified Inventory Assets Report
OUTPUTS
Non-Verified Assets Report
Verified Inventory Assets Report
RESOURCES
Assets File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Computer Time
Data Teminal

MINISTRY OF EDUCATION AND CULTURE　　INPUT - OUTPUT SHEET 4.2.2.

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Assets Report	150/yr.	open	Depts. & Offices			From 75 offices in the Ministry
	identification data		open		2		
	purchased items	unknown	open		7		
	donated items	unknown	open		8		
	property items	unknown	open		7		
E2	Verified Assets Report	20/mo.	open open	Assets Dept.			Verified in depts. & offices; assume two corrections per item.
S1	Verified Inventory Assets Report	150/yr,	open	Comptroller			Verified items only
	identification		open		2		
	purchased items	unknown	open		6		
	donated items	unknown	open		7		
	property items	unknown	open		7		
S2	Non-Verified Assets Report	20/mo.	open open	Assets Activity			For verification purposes
	identification		open		2		
	purchased items	unknown	open		7		
	donated items	unknown	open		8		
	property items	unknown	open		7		

Date:　　Analyst: M. Mehlis　　Activity: Assets

Study: Ministry of Education　　Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE — REQUIRED OPERATIONS SHEETS 4.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01.	Code Items All items -- purchased, donated or property -- on the assets report shall be coded before entering them into the file.	1	7	150/yr.
02	Prepared Verified Inventory Assets Report A verified inventory report is prepared for the National Comptroller's Office. The items on this report have been previously verified. The report is listed by office.	2	1,070	390/yr.

An inventory report is prepared for use in verifying items indicated on the assets report. The verification takes place at the office which issued the original assets report.

Date:

Analyst: M. Mehlis

Activity: Assets

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 4.2.4

N°	Name and Description	Amount	Cost $US.	Notes
R1	Assets File	1	183/yr.	75 offices, 100 items, 8 buildings; Ministry assets only
R2	Input Preparation Clerk	1	60/mo.	
R3	Input/Output Control Clerk	1	60/mo.	
R4	Computer Time (At this point, it is impractical to estimate hours of usage.)		40/hr.	New CENACO computer
R5	Data Terminal with Keyboard and Printer	1	6,500	Purchase

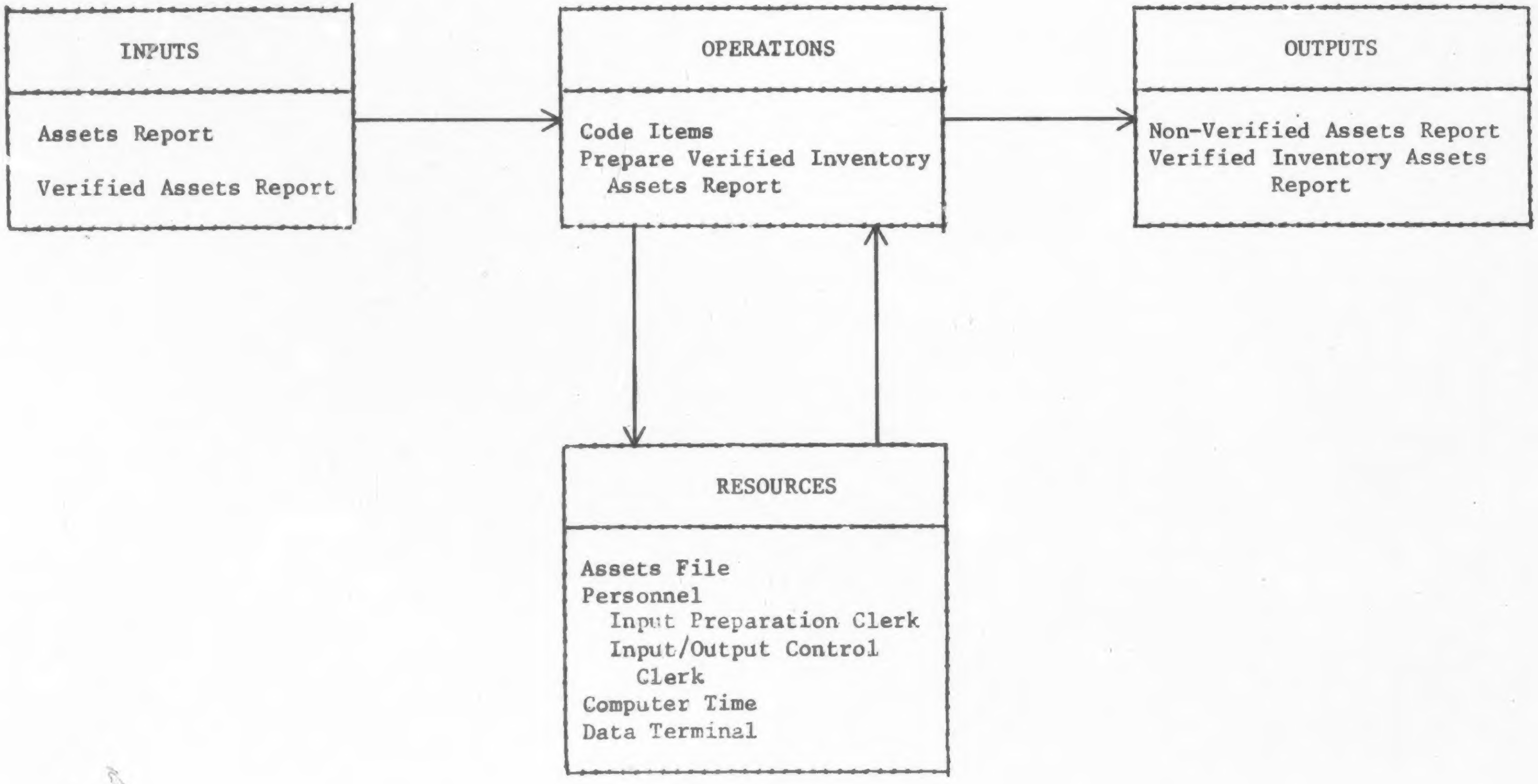
Date: Analyst: M. Mehlis Activity: Assets

Study: Ministry of Education Page 1 of 1

4.2.1

ASSETS REQUIREMENTS MODEL

DISTRICT LEVEL


INPUTS
Assets Report
Verified Assets Report
OPERATIONS
Code Items
Prepare Verified Inventory Assets Report
OUTPUTS
Non-Verified Assets Report
Verified Inventory Assets Report
RESOURCES
Assets File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT -OUTPUT SHEET 4.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Assets Report	1,740/yr	open	Schools & Offices			Every 6 months from 845 schools, 3 district offices and 22 supervisory offices
	identification				2		
	purchased items	unknown			7		
	donated items	unknown			8		
	property items	unknown					
E2	Verified Assets Report	145/mo.	open	SIDA & Supervisors			Verified items in schools & offices; assume 2 corrections per item.
	identification				2		
	item	unknown			4		
S1	Verified Inventory Assets Report	1,740/yr.	set data	Comptroller			Verified items only
	identification				2		
	purchased items	unknown			6		
	donated items	unknown			7		
	property items	unknown					
S2	Non-Verified Assets Report	45/mo.	open	SIDA, Supervisors, Schools	2		For verification purposes
	identification				2		
	purchased items	unknown			7		
	donated items	unknown			8		
	property items	unknown					

Date: Analyst: M. Mehlis Activity: Assets

Study: Departmental Rural and Urban District Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE

REQUIRED OPERATIONS SHEET 4.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Code Items All items -- purchased, donated or property -- on the assets report must be coded before entering them into the file.	1	7	1,740/yr.
02	Prepare Verified Inventory Assets Report A verified inventory report is prepared for the Comptroller's Office. The items on this report have been previously verified. The report is listed by school.	1,045	8,360	3,480/yr.

An inventory report is prepared for use in verifyng items indicated on the assets report. The verification takes place at the school which issued the original assets report.

Date:

Analyst: M. Mehlis

Activity: Assets

Study: Departmental Rural and Urban District

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE

RESOURCE SHEET 4.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Assets File	1	970/yr.	845 schools, 22 supervisors' offices, 3 District offices, 100 items
R2	Input Preparation Clerk	1	50/mo.	
R3	Input/Output Control Clerk	1	50/mo.	
R4	Computer Time (At this point, it is impractical to estimate hours of usage.)		50/hr.	New CENACO computer
R5	Data terminal with Keyboard and Printer	1	25,000	Purchase

Date:

Analyst: M. Mehlis

Activity: Assets

Study: Departmental Rural and Urban District

Page 1 of 1

5.0 ACTIVITY - INVENTORY AND DISTRIBUTION

5.1 General

5.1.1 Goals and Objectives

This activity shall maintain a permanent record of all food items, scholastic materials, and supply items received and distributed throughout the educational system. It shall provide applicable data to agencies which donate some of the items and materials.

5.1.2 Scope and Boundary

The activity shall receive and distribute all food items and scholastic materials. It shall be performed at the national level only, and the Inventory and Distribution Section of the Purchases and Supplies Division shall be responsible for the activity. Supply items shall be purchased by the Purchases and Supplies Division and distributed by the Inventory and Distribution Section. These items shall be for the national level only. A file shall be maintained and updated for all three types of items. The Inventory and Distribution Section shall be responsible for implementing supplies distribution policy.

At the district level, the SIDA office shall be responsible for purchasing and distributing supplies, and for maintaining an updated file.

5.1.3 General Considerations

All supply items for the national level shall be acquired by the Purchases and Supplies Division. These items shall be considered consumable.

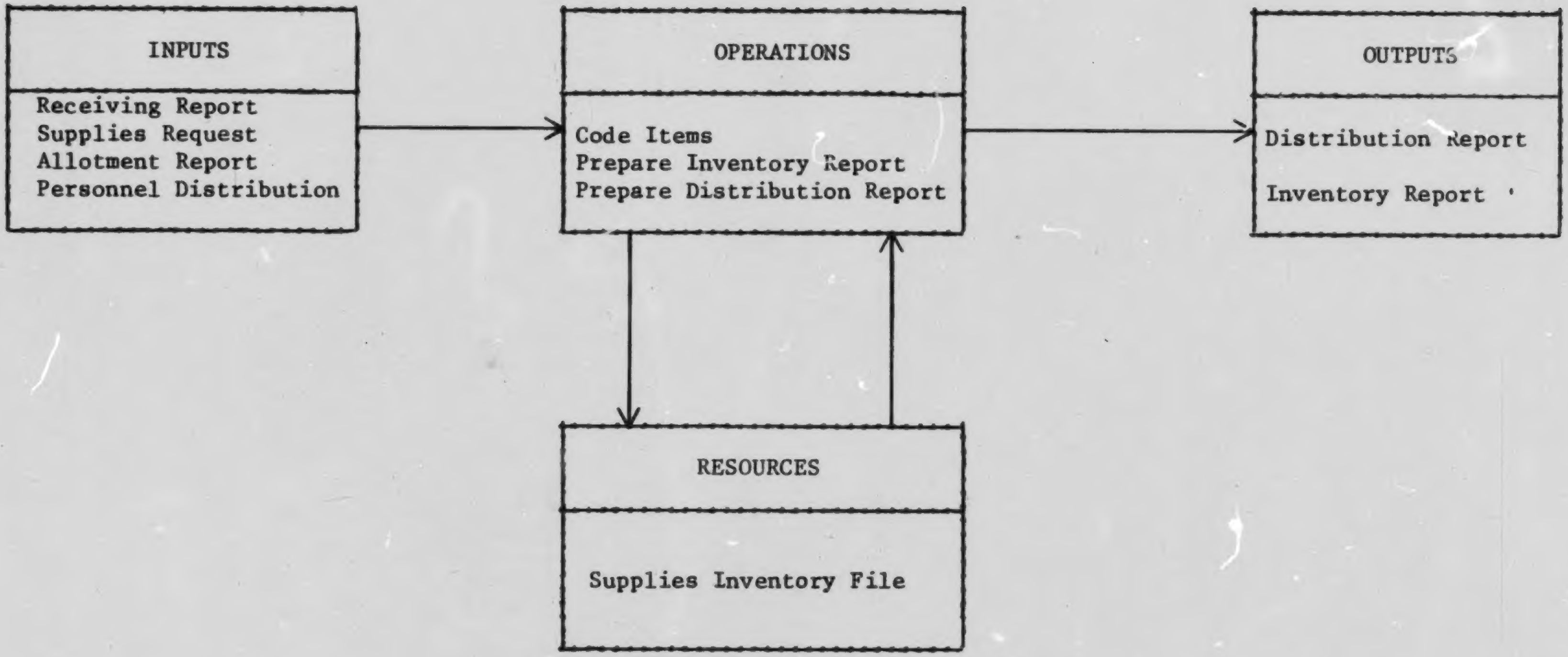
The existing food distribution section, scholastic materials warehouse, and supplies distribution section shall be combined into one section under the Purchases and Supplies Division. All purchasing activities at the national level, for whatever purpose, shall be centralized in the Purchases and Supplies Division.

5.2 OPERATIONS

5.2.1

INVENTORY AND DISTRIBUTION REQUIREMENTS MODEL

SUPPLIES-NATIONAL LEVEL


INPUTS
Receiving Report
Supplies Request
Allotment Report
Personnel Distribution
OPERATIONS
Code Items
Prepare Inventory Report
Prepare Distribution Report
OUTPUTS
Distribution Report
Inventory Report
RESOURCES
Supplies Inventory File

MINISTRY OF EDUCATION AND CULTURE

INPUT - OUTPUT SHEET 5.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Receiving Report	4/yr	set format	Vendors			Office, cleaning & sanitary patriotic, etc. items
	purchased item				8		78 items
E2	Supplies Requests	random	open	Offices, Depts.	6		
E3	Allotment Report	1/yr.	open	Purchase/ Supply Division			Consumption rates for supplies
	item data				4		
E4	Personnel Distribution	4/yr.	open	Information	4		
S1	Distribution Report	1/mo	open	Offices Depts.			To 80 offices
	item data				7		78 items
	office data				2		80 offices
S2	Iventory Report	1/mo.	open	Purchase/ Supply Div.			Total inventory
	item data				6		

Date:

Analyst: M. Mehlis

Activity: Inventory & Distribution Supplies

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEET 5.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Code Items All purchased supplies on the Receiving Reports shall be coded before they are entered into the file.	78	624	4/year
02	Prepare Inventory Report An Inventory Report is prepared, indicating the amounts of 78 supply items received, consumed, and on-hand.	78	780	1/mo.
03	Prepare Distribution Report A distribution report is prepared for each office and department at the national level, showing the supply items it received during the month. The report shall include quantities and values.	75	5850	1/mo.

Date:

Analyst: M. Mehlis

Activity: Inventory and Distribution Supplies

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 5.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Supplies Inventory File	1	153/yr.	78 supply items 75 offices in Ministry

Date: Analyst: M. Mehlis Activity: Inventory and Distribution Supplies

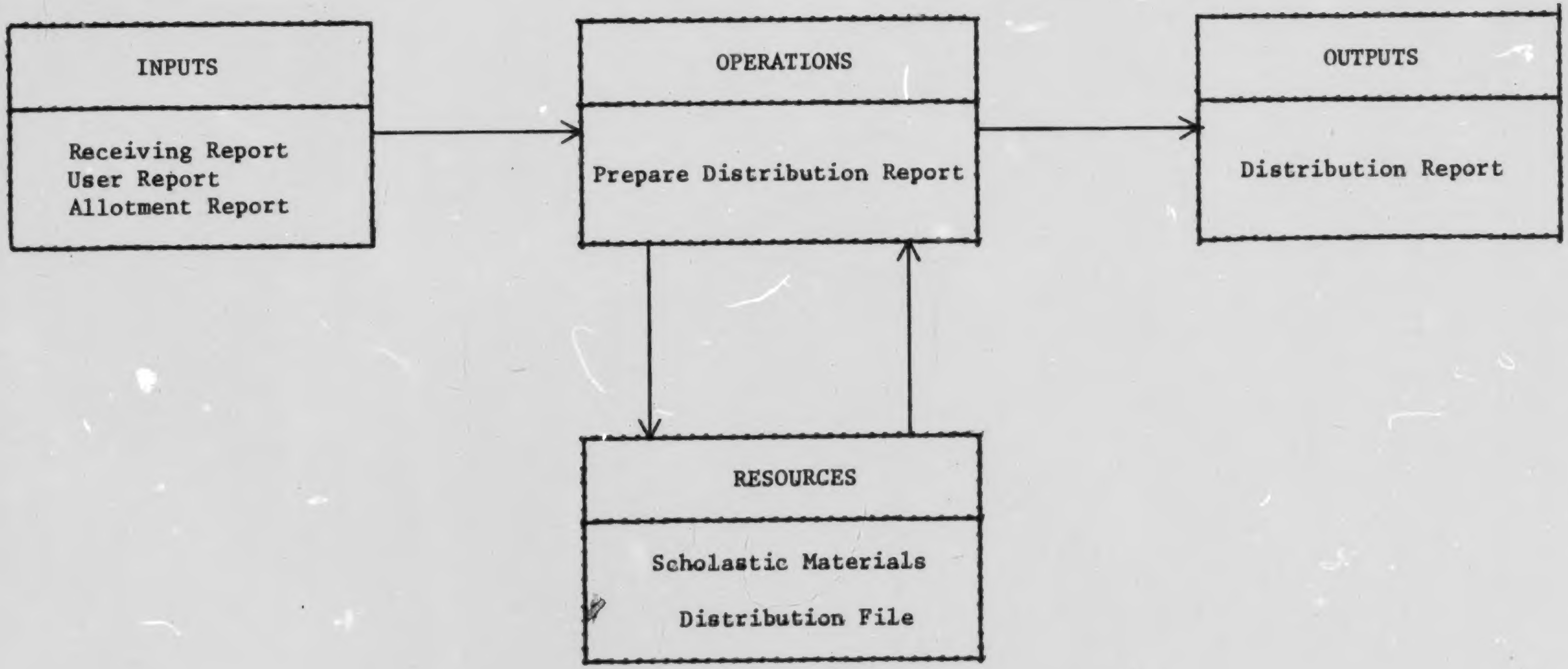
Study: Ministry of Education Page 1 of 1

5.2.1

INVENTORY ANDDISTRIBUTION REQUIREMENTS MODEL

SCHOLASTIC MATERIALS

NATIONAL LEVEL


INPUTS
Receiving Report
User Report
Allotment Report
OPERATIONS
Prepare Distribution Report
OUTPUTS
Distribution Report
RESOURCES
Scholastic Materials
Distribution File

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 5.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Receiving Report		set	Donors	6		4 donors
	donated items	random	format				200 items
	purchased items	2/yr.	open	CONES	6		5 items
	destination data		set format	Donors	2		For donated items
	sales items	random	open	Donors	8		15 items
E2	User Reports	2/yr.	open	Information			From 7,600 schools
	school data				6		
E3	Allotment Report	1/yr.	open	CONES			Consuption rate
	item data				6		
S1	Distribution Report						
	purchased items	2/yr.	open	CONES	6		
	donated items	random	open	Donors	6		
	sales items	random	open	Financial Dept. & Donors	8		

Date:

Analyst: M. Mehlis

Activity: Inventory & Distribution Scholastic Materials

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE   REQUIRED OPERATIONS SHEETS 5.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Distribution Report	220	1,680	2/yr. & random

A distribution report is prepared, indicating destination of scholastic material items. The same is prepared, whether for purchased, donated or sales items to be distributed.

Donated items are previously destined by the donor.

Sales items are sold by various educational offices.

Purchased items are distributed to pre-established educational sectors.

Date:

Analyst: M. Mehlis

Activity: Inventory and Distribution Scholastic Materials.

Study: Ministry of Education

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MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 5.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Scholastic Materials Distribution File	1	220/yr.	220 items

Date:

Analyst: M. Mehlis

Activity: Inventory and Distribution Scholastic Materials

Study: Ministry of Education

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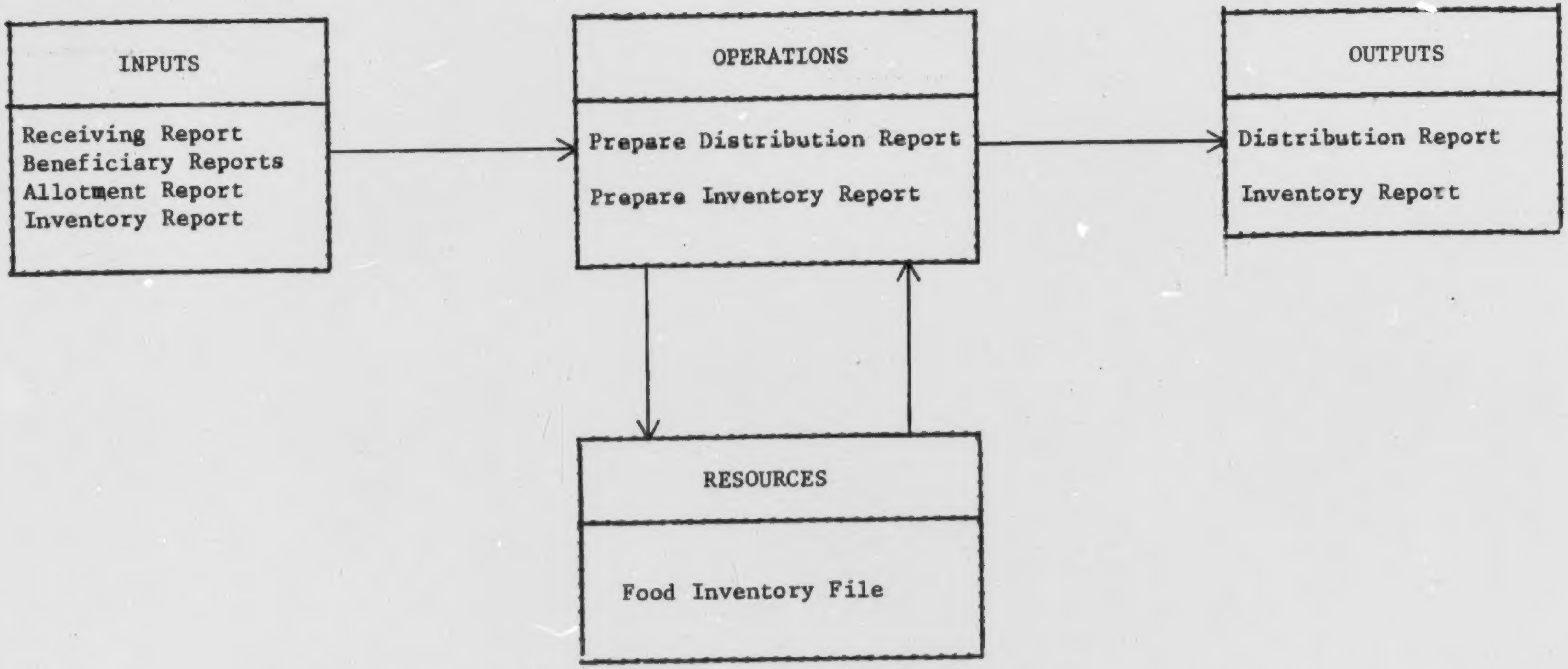
5.2.1

INVENTORY AND DISTRIBUTION REQUIREMENTS MODEL

FOOD - NATIONAL LEVEL


INPUTS
Receiving Report
Beneficiary Reports
Allotment Report
Inventory Report
OPERATIONS
Prepare Distribution Report
Prepare Inventory Report
OUTPUTS
Distribution Report
Inventory Report
RESOURCES
Food Inventory File

MINISTRY OF EDUCATION AND CULTURE

INPUT - OUTPUT SHEET 5.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Receiving Report	random	open	ALDE			9 Food items
	item data				6		
E2	Beneficiary Reports	2/yr.	open	Information			From 14 normal schools and 2 institutes; 338 persons/school
	school data				5		
E3	Allotment Report	1/yr.	open	ALDE			Consumption rates on 9 food items
	item data				3		
E4	Inventory Report	1/mo.	open	Schools			From 16 schools
	school data				2		
	item data				6		
S1	Distribution Report	1/mo.	open	ALDE, U.N., Ministry			
	school data				2		
	item data				4		
S2	Inventory Report	1/mo.	open	ALDE, U.N., Ministry	36		On total inventory
	item data				5		
	school data				2		

Date:

Analyst: M. Mehlis

Activity: Inventory and Distribution/Food

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATION SHEET 5.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Distribution Report A distribution report is prepared, showing the amounts of 9 food items distributed, during the month, to 16 schools.	25	144	1/mo.
02	Prepare Inventory Report An Inventory Report is prepared, giving the amounts of 9 food items held in the central warehouse and the amounts received, consumed, and on-hand in 16 schools.	144	576	1/mo.

Date:

Analyst: M. Mehlis

Activity: Inventory & Distribution/Food

Study: Ministry of Education

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MINISTRY OF EDUCATION AND CULTURE

RESOURCE SHEET 5.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Food Inventory File	1	25/yr.	9 food items 16 schools

Date:

Analyst: M. Mehlis

Activity: Inventory & Distribution/Food

Study: Ministry of Education

Page 1 of 1

6.0 ACTIVITY - INFORMATION

6.1 General

6.1.1 Goals and Objectives

This activity shall provide overall information to users at the national level for operational, planning, and policy-making purposes. It shall provide overall district information to users at the district level for operational and planning purposes. It shall also provide information requested by international agencies and others external to the Ministry of Education.

This activity shall include handling and managing the legal statutes archives. The archives shall provide a permanent record of all legal statutes pertaining to educational policy, from which copies can be easily provided, as required.

6.1.2 Scope and Boundary

The information activity shall have access to any and all national level files and district files. This activity at the district level shall be handled by the SIDA office, which shall have access to all activity files of its district and no other.

At the national level, the information reports shall include the following:

- Personnel
- Salaries
- Assets
- Schools
- Students
- Activities
- Finances
- Inventory and distribution

At the district level, the information reports shall include all of the above, except finances and inventory and distribution.

This activity shall also include the legal statutes archives. The statutes shall comprise Supreme Decrees, Supreme Resolutions and Ministerial Resolutions. Ministerial Resolutions relating to personnel affairs shall not be included. The archives shall include informational reports for policymaking and planning which are generated by the new Communications/ Information System.

6.1.3 General Considerations

All statistical or information activities at the national level shall be combined into one single activity under the Information Department. At the district level, all data to and from the SIDA office and the schools shall be channeled through the respective supervisors.

Supervisors shall not be involved in data-gathering or data-manipulation activities. Data-gathering shall be performed by the schools and offices; data-manipulation shall be performed by the Information Section of the SIDA office.

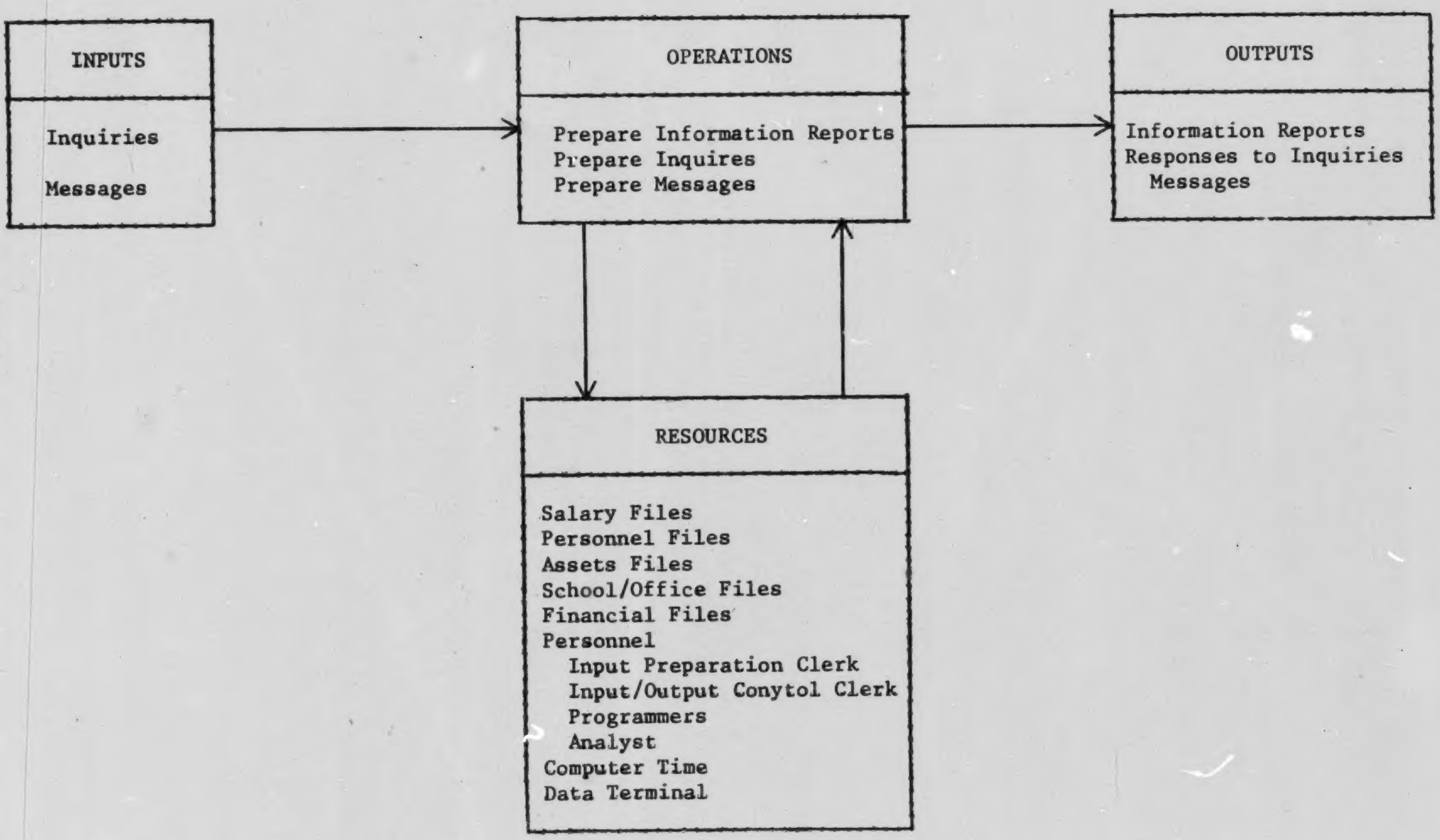
The Information Department should be a staff function at the ministerial or subsecretary level. The statutes archives shall be a section of the Information Department. The archives may be mechanized into permanent files through the use of microfilm techniques. However, before deciding whether this informational recording and retrieval technique is equal to or lower in cost than the present one, a cost analysis is required.

6.2 OPERATIONS

6.2.1

INFORMATION REQUIREMENTS MODEL

NATIONAL LEVEL


INPUTS
Inquiries
Messages
OPERATIONS
Prepare Information Reports
Prepare Inquires
Prepare Messages
OUTPUTS
Information Reports
Responses to Inquiries
Messages
RESOURCES
Salary Files
Personnel Files
Assets Files
School/Office Files
Financial Files
Personnel
Input Preparation Clerk
Input/Output Conytol Clerk
Programmers
Analyst
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 6.2.2

N°	Name	Rate	Medium	Source Desti-nation	N° of Fields	N° of Chars.	Notes
E1	Inquiries	unknown	open	Offices, Depts.			At national or district level
E2	Messages	unknown	open	Offices, Depts.			To districts
S1	Information Reports activities personnel salaries students schools assets financial inventory distribution	unknown	open	Offices, Depts., External Users			National and/or district level
S2	Responses	unknown	open	Offices, Depts.			National and/or District level
S3	Messages	unknown	open	Offices, Depts.			From districts

Date: Analyst: M. Mehlis Activity: Information - National level

Study: Ministry of Education Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE

REQUIRED OPERATIONS SHEET 6.2.3

N°	Operation Name	Input Factors	OutPut Factors	Frequency of Execution
01	Prepare Information Reports Information reports are prepared for operational requirements at the national level and for planning purposes for the entire educational system, at the national and district levels.			Unknown
02	Prepare Inquiry Inquiries are prepared to obtain information and data from the national and district central files.			Unknown
03	Prepare Messages Messages are prepared for sending to the districts.			Unknown

Date:

Analyst: M. Mehlis

Activity: Information - National Level

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 6.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Salary Files	10	45,837 630	9 - Districts 1 - National level
R2	Personnel Files	10	45,837 630	9 - Districts 1 - National level
R3	Assets Files	10	8,730 183	9 - Districts 1 - National level
R4	School/Office Files	9	127,764	9 - Districts
R5	Financial Files	1	100	National level only
R6	Input Preparation Clerk	1	60/mo.	
R7	Input-Output Control Clerk	1	60/mo.	
R8	Programmers	2	300/mo.	
R9	Analyst	1	250/mo.	
R10	Computer Time (At this point, it is impractical to estimate hours of usage.)		40/hr.	New CENACO computer
R11	Data Terminal with Keyboard and Printer	1	65,000	Purchase

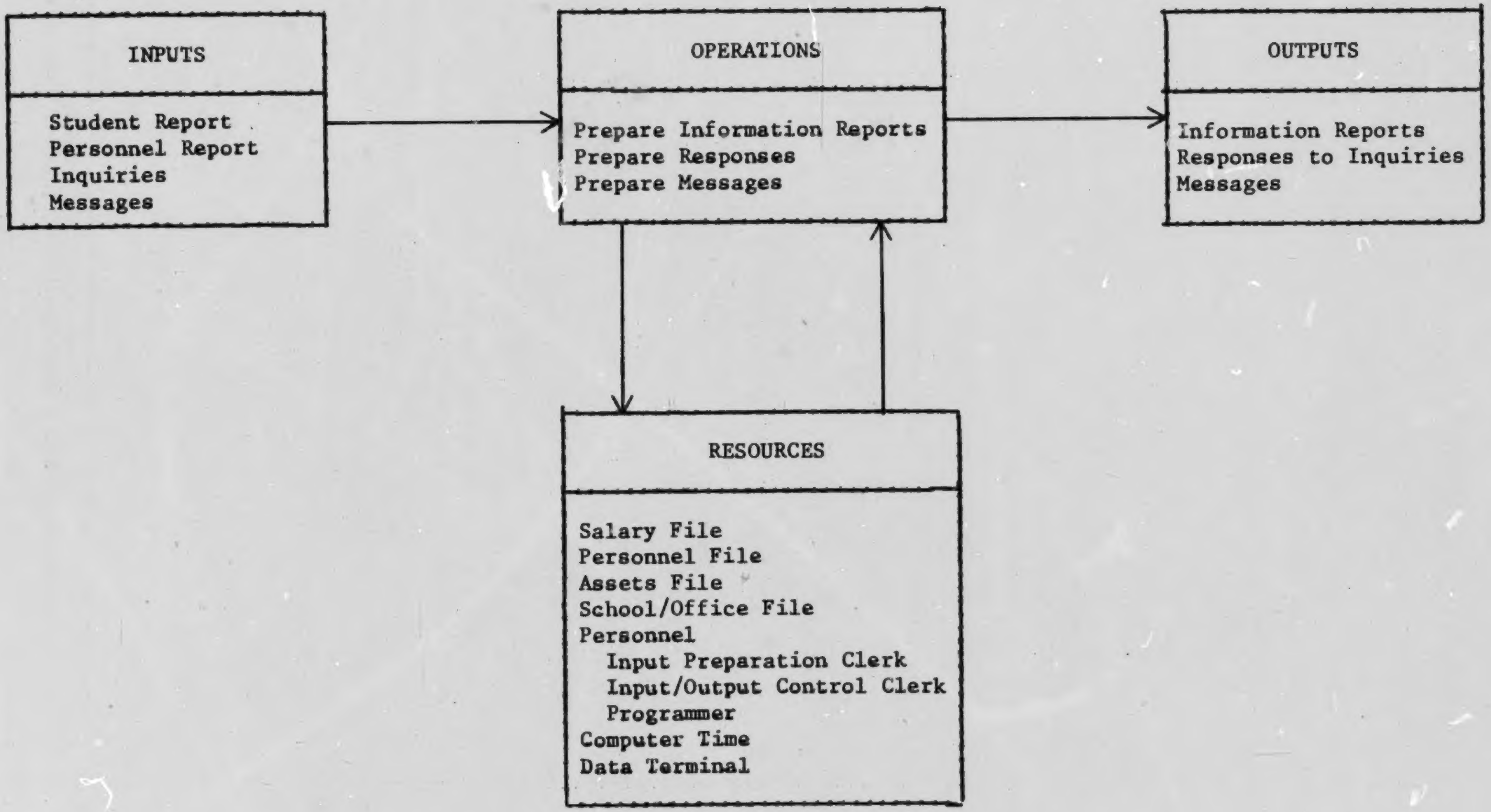
Date: Analyst: M. Mehlis Activity: Information - National Level

Study: Ministry of Education Page 1 of 1

6.2.1

INFORMATION REQUIREMENTS MODEL

DISTRICT LEVEL


INPUTS
Student Report
Personnel Report
Inquiries
Messages
OPERATIONS
Prepare Information Reports
Prepare Responses
Prepare Messages
OUTPUTS
Information Reports
Responses to Inquiries
Messages
RESOURCES
Salary File
Personnel File
Assets File
School/Office File
Personnel
Input Preparation Clerk
Input/Output Control Clerk
Programmer
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 6.2.2.

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars.	Notes
E1	Student Report	3/yr.	open	Schools	15		From 845 schools, on 136,100 students
E2	Personnel Report	3/yr.	open	Schools and District Offices			From 845 schools, on 5,022 teachers
	identification				2		
	school/office ID		open		2		
	locality		open		3		
	activity		open		7		
	student report		open		15		
E3	Inquiries	200/mo.	open	SIDA			Personnel inquiries, etc.; district only
E4	Messages	Unknown	open	SIDA			To La Paz
S1	Information Reports activities personnel assets students schools salaries	Unknown	open	SIDA & District Offices			For the district only
S2	Responses	Unknown	open	District			
S3	Messages	Unknown	open	La Paz			

Date:

Analyst: M. Mehlis

Activity: Information - District Level

Study: Departmental Rural and Urban District

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE

REQUIRED OPERATIONS SHEET 6.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Prepare Information Reports Information reports are prepared for operational requirements at the district level, supervisory level, and school level.			Unknown
02	Prepare Inquiries Inquiries are prepared to obtain information from the district central files.			Unknown
03	Prepare Messages Messages are prepared for transmission to the national level.			Unknown

Date:

Analyst: M. Mehlis

Activity: Information - District Level

Study: Departmental Rural and Urban District

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 6.2.4

N°	Name and Description	Amount	Cost $US	Notes
R1	Salary File	1	5,093/yr.	District
R2	Personnel File	1	5,093/yr.	District
R3	Assets File	1	970/yr.	District
R4	School/Office File	1	14,196/yr.	845 Schools 5,022 Teachers 136,100 students
R5	Input Preparation Clerk	1	50/mo.	
R6	Input/Output Control Clerk	1	50/mo.	
R7	Programmer	1	100/mo.	
R8	Computer Time (At this point, it is impractical to estimate hours of usage.)		50/hr.	New CENACO computer
R9	Data Terminal with Keyboard and Printer	1	25,000	Purchase

Date:

Analyst: M. Mehlis

Activity: Information - District Level

Study: Departmental Rural and Urban District Page 1 of 1

7.0 ACTIVITY - BUDGET CONTROL

7.1 General

7.1.1 Goals and Objectives

This activity shall maintain a record of all expenditures made against the educational budget. In addition, it shall exercise control over the budget. It shall also provide applicable budget and expenditure data to the governmental agencies which require it.

7.1.2 Scope and Boundary

This activity shall be part of the national level financial activities. It shall range from reception of invoices and pertinent data to the emission of payment vouchers. It shall maintain a file of pertinent information regarding invoices and balances of budget accounts. Access to the file of this activity shall be limited to the Department of Financial Administration, of which Budget Control is a division. All policy regarding budget control and expenditures shall be established and defined by the Department of Financial Administration.

7.1.3 General Considerations

All budget expenditures operations shall be combined into one centralized operation at the national level, as part of the financial activities at that level.

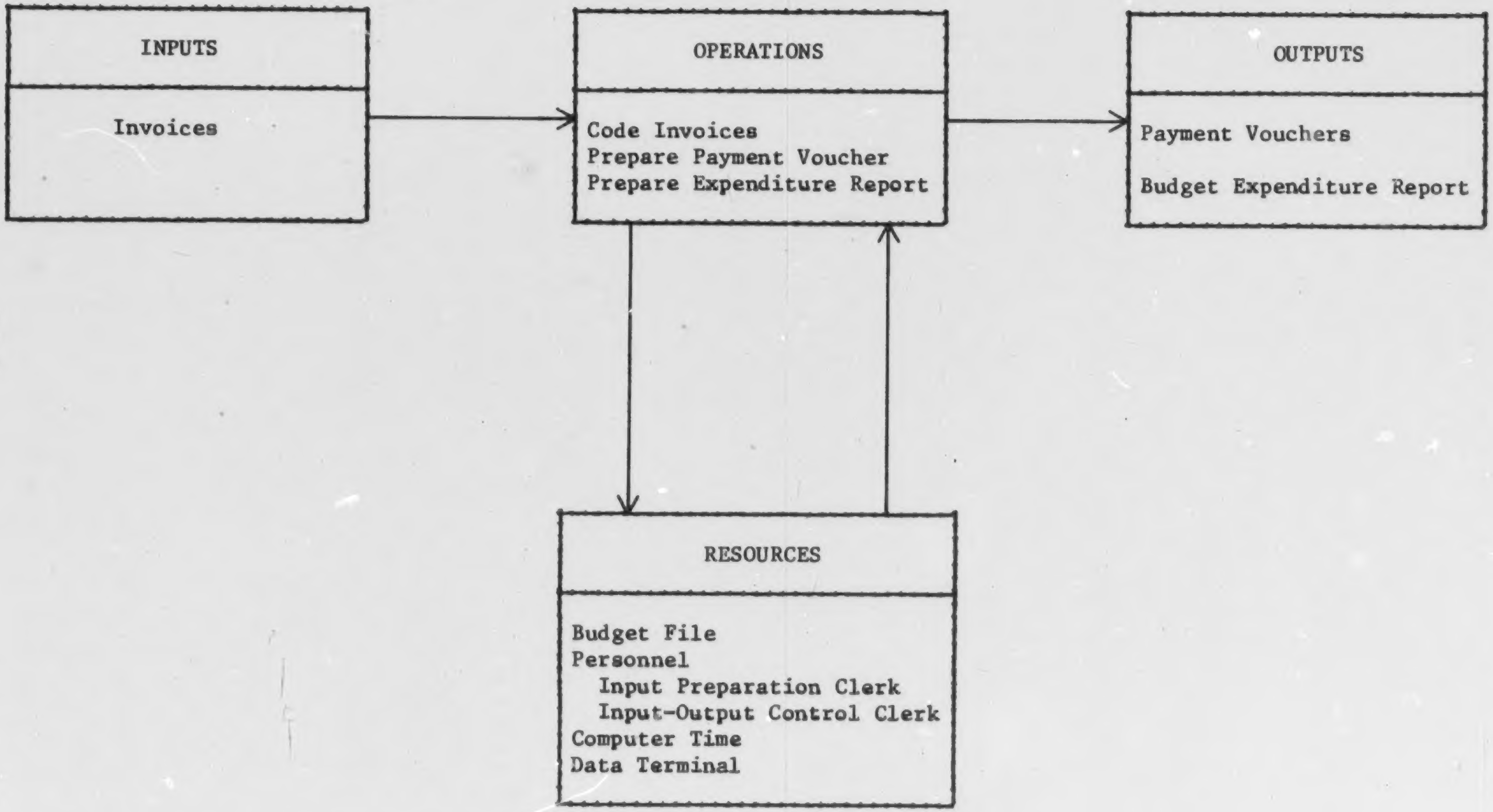
The complete financial activity is not included in this report or in the new system plan, due to the fact that -- in the present system -- most of the financial activity is performed by the Ministry of Finance and is completely out of the hands of the Ministry of Education.

7.2 OPERATIONS

7.2.1

BUDGET CONTROL REQUIREMENTS MODEL

NATIONAL LEVEL


INPUTS
Invoices
OPERATIONS
Code Invoices
Prepare Payment Voucher
Prepare Expenditure Report
OUTPUTS
Payment Vouchers
Budget Expenditure Report
RESOURCES
Budget File
Personnel
Input Preparation Clerk
Input-Output Control Clerk
Computer Time
Data Terminal

MINISTRY OF EDUCATION AND CULTURE INPUT - OUTPUT SHEET 7.2.2

N°	Name	Rate	Medium	Source Destination	N° of Fields	N° of Chars	Notes
E1	Invoices	2,380/yr.	set form	Financial Dept.	8		For goods & service
S1	Payment Voucher	2,380/yr.	open	Supplies	5		
S2	Budget Expenditure Report	one/wk.	open	Financial Dept.	6		For 100 accounts

Date: Analyst: M. Mehlis Activity: Budget Control

Study: Ministry of Education Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE REQUIRED OPERATIONS SHEET 7.2.3

N°	Operation Name	Input Factors	Output Factors	Frequency of Execution
01	Code Invoices All invoices shall be coded with budget account codes, before they are entered into the Budget Expenditures File.	7	8	2,380/yr.
02	Prepare Payment Vouchers A Payment Voucher is prepared for suppliers of goods and services and for each invoice.	7	5	2,380/yr.
03	Prepare Expenditure Report An Expenditure Report is prepared to indicate the amounts spent, budgeted, and the balances by budget accounts.	100	600	one/week

Date:

Analyst: M. Mehlis

Activity: Budget Control

Study: Ministry of Education

Page 1 of 1

MINISTRY OF EDUCATION AND CULTURE RESOURCE SHEET 7.2.4.

N°	Name and Description	Amount	Cost $US	Notes
R1	Budget File	1	100/yr.	100 budget accounts
R2	Input Preparation Clerk	1	60/mo.	
R3	Input/Output Control Clerk	1	60/mo.	
R5	Computer Time		40/hr.	New CENACO computer
	(At this point, it is impractical to estimate hours of usage.)			
R6	Data terminal with Keyboard and Printer		6,500	Purchase

Date: Analyst: M. Mehlis Activity: Budget Control

Study: Ministry of Education Page 1 of 1

8.0 ACTIVITY - PRINTING

8.1 General

8.1.1 Goals and Objectives

This activity shall provide all the printing services required by departments and offices at the national level (Ministry of Education).

8.1.2 Scope and Boundary

This activity shall be performed by a centralized facility containing all the printing equipments in the Ministry. The types of printing services to be provided are stencil, offset and flat printing. The cost of the printing service must be equal to or less than that provided by similar outside commercial services.

8.1.3 General Considerations

The two printing facilities at SATE and Educational Planning must be combined into one facility. However, before deciding whether this facility can realistically provide printing services at equal or lower cost than outside commercial services, a cost analysis is required. Elsewhere in this report is a suggestion that SATE be decentralized and otherwise modified, so that it could provide printing services (as well as the other services which it performs) on a nationwide basis.

9.0 ADDITIONAL COMMENTS: STRENGTHENING THE COMMUNICATION CHAIN

In a system typified by irregularity, unreliability, informality, and inefficiency, improvement can only be effected through modifications which will promote (if not guarantee) the exact opposites of these characteristics. Thus, if an effort to enhance precisely regularity, reliability, formality, and efficiency, the following suggestions are offered vis-à-vis system requirements, in addition to those mentioned earlier in this section. (Specifications for these suggestions will be found in Part III of this report.)

9.1 Ministerial Level:

The Ministry simply must have one central building capable of housing all of its various dependencies (with the possible exception of warehouses). If the building is to be constructed (which would be ideal), its facilities and office configuration should reflect the needs for personnel, equipment, space, etc., implied in plans for the administrative reform. Needless to say, the ministerial structure must include an adequate telephone system -- both internal and external. Clearly, the existence of a central edifice would eliminate many communications problems; certainly, it would preclude the need for ministerial employees to travel from one point in La Paz to another, in order to make contact.

Each department head should initiate regular, fixed staff meetings; the director of several departments should also meet regularly with his department chiefs. (In concept, this is not unlike the meetings of the Minister with his Consejo Tecnico.) Functionaries -- particularly high-level ones -- must abide by regular office hours. Clearly, there are times when people must leave the office (ergo, to attend meetings); but these should be kept to a minimum, so that the functionary has time to complete his regular work, and so that he can be reached by anyone attempting to contact him. Commensurately, high-level functionaries must maintain specific, fixed hours in which they will allow public audiences. To permit one's office to be constantly filled with audience-seekers, and to allow oneself to be constantly available to anyone who wants an audience is not only unrealistic and irrational, it is an enormous drain on the individual's time. Another serious time loss is incurred by the person who -- in conjunction with his official responsibilities -- must maintain numerous contacts outside the Ministry, or who must depend on irregular, ad hoc contacts within the Ministry, in order to fulfill his duties. Such contacts can take 50%

to 65% of the individual's time. In most instances, the functionary has a good idea of what his regular, necessary contacts are; he should make every effort to formalize and regularize, fix and limit these contacts, so that he has adequate time to devote to his regular office duties. Finally, a total overhaul and re-planning of the Ministry's system of correspondence control is essential.

9.2 Ministry - District Directorate:

There is no way to completely solve the communications problem on this level. An adequate solution would entail the improvement of the national road and transportation systems, the national mail system, the national system of telegraph and radio communications, and Lloyd Aereo Boliviano. Obviously, such cannot be done. What can be done, however (and what is, moreover, highly feasible), is to reduce the present total dependence on these inadequate national systems. This can be accomplished through a two-way radio system which will allow immediate and continual communication between the Ministry and the district directorates (and, as will be mentioned later, between the district directorates and the supervisory zones within each district). Such a system would not, of course, relieve the need to send written communications by the current methods; and, these communications would continue to arrive "tarde, mal, o nunca". However, the same message could be conveyed immediately and accurately via radio -- allowing the districts the opportunity for feedback, questions, and clarification -- pending the arrival of the written communication. Moreover, the system would obviate the need (and the expense) for making telephone calls, sending telegrams, and conducting unnecessary travel. Needless to say, it would also increase the level of contact and the over-all flow of communication between the Ministry and the districts -- a fact which, in itself, should have a generally salubrious effect on Bolivian education -- and it would regularize such contact/communication.

Official travel -- though reduced -- would not be eliminated; thus, the problem of travel expenses and per diem remains. These simply must be supplied by the Ministry to any functionary who is called to La Paz or is otherwise performing officially authorized travel. No one can or should be expected to pay his own expenses, if he is traveling in conjunction with his official duties. (Obviously, this also applies to ministerial officials visiting the districts.)

To further regularize contact between the Ministry and the districts, to allow district directors a greater role and voice in educational policy-making, and to broaden their professional knowledge and experience, a series of planned, regularly-scheduled national conferences/congresses should be initiated. These would include not only discussions on Bolivian education, but also presentations by specially-invited foreign experts, educational workshops, and any other content deemed desirable.

9.3 Within the District Directorate:

There is no real reason for poor communications within a given district directorate. Those problems which do exist could be greatly alleviated by the simple expedient of regular, fixed, reasonably frequent meetings between a district director and his supervisors, to allow for the planning of work, scheduling of and reporting on activities, discussing problems, etc. In the extreme cases where a recalcitrant or negligent director simply refuses to use the means regularly available for communication with his supervisors, action should be taken by the Direction General of Education.

A series of planned, tailored, regularly-scheduled national conferences/congresses for supervisors should also be initiated, for the same reasons as those noted above for district directors. Additionally, such congresses would bring supervisors together with their colleagues from other districts, thus allowing an opportunity for professional interaction and interchange which does not presently exist.

9.4 District Directorate - Schools/Nucleos:

Both of the basic problems at this level -- the flow of communications between the two entities, and the transportation difficulties of supervisors -- could be solved with a three-pronged strategy: 1) Move each zonal supervisor out of the district capital and into the chief town of the zone for which he is responsible; 2) Provide him with a radio set (i.e., extend the two-way radio system down to the zonal level), to allow contact with and immediate transmission of messages to and from the district directorate; 3) Provide him with his own transportation facilities (ergo, a motorcycle, a boat with motor, or -- in some instances -- even a bicycle), so that he is free to make personal contact with the district directorate and/or visit and carry messages to his schools/nucleo . (In the case of supervisors whose offices remain in the district directorate -- ergo, most urban supervisors, all 'speciality' supervisors-- transportation facilities must also be provided; the supervisor must have either his own motorcycle, for example, or access to a vehicle of the district directorate.)

Thus, the zonal supervisor would be the channel for all communication between the district directorate and the school/nucleo. Urgent messages from the directorate could be sent to him immediately via radio, for him to communicate to the schools/nucleos with the use of his motorcycle; urgent messages from the schools/nucleos could be carried to him by messenger, for immediate radio transmission to the district directorate; written communications (either those sent as a follow-up to urgent radio communications, or those which are of a normal, non-urgent nature) and materials could be delivered to him by messenger (or even by the current methods), and then delivered by him on his motorcycle. These suggestions should not be construed as meaning that the zonal supervisor will be a glorified errand-boy. Providing the communications link at this level is already one of his main functions; the objective is merely to provide him with the necessary tools, so that both the communications function and his ability to to perform it are strengthened. This will not be unduly time-consuming to the supervisor.

Thus, the changes suggested would provide a stable, regular, reliable, and rapid communications channel. They would eliminate the waste of time and money on telegrams and unnecessary travel; and they would facilitate the supervisor's performance of his basic responsibility -- supervision -- by allowing him to visit his schools more often and with greater ease. (It goes without saying that the supervisor, while traveling officially, must also be provided with adequate per diem by the Ministry, through the district directorate.) Thus, educational services to outlying schools/nucleos would be increased, as would their over-all contact with the district directorate; this should help considerably in diminishing the feeling of deprivation and isolation experienced by educators in these schools.

9.5 Within Schools and Nucleos:

On this level, no particular recommendations are called for. The only suggestion would be that all school/nucleos institute regularly-scheduled staff meetings, with pre-established agendas.

9.6 Between Nucleos and Seccionales:

In the transmission of written communications, the system at this level works quite well, given the very limited resources to which it has access. Any real improvement would entail such an enormous financial investment, that it would not be worthwhile. The formalized system used in Chuquisaca -- the use of campesino "runners" to deliver messages -- seems to be a valid model for other districts to imitate, whenever feasible. This would lessen dependence on the erratic methods currently used -- buses, travelers, etc.

The major problem seems to be transportation facilities for the nucleo director, so that he might pay regular visits to his seccionales without an undue time loss, and so that emergency travel can be performed -- to a seccional, to the zonal supervisor, or to the district directorate -- when there is an urgent need. Such transportation facilities must be provided, as well as a minimal per diem, if the nucleo director is expected to do his job well.

Also, the problem of isolation must not be taken lightly. Nucleo directors -- as their colleagues in the provicial urban schools -- need an increased opportunity to exchange professional ideas, experiences, and problems with their fellow nucleo directors. For this reason, a series of conferences/ congressess - preferably on the national level, but at least on the district level -- similar to those referred to earlier should be initiated by the Ministry.

Part II has outlined the basic requirements and implied the fundamental changes which will be necessary, if indeed the system of communications/ information within the administrative sector of the Bolivian educational system is to become regular, reliable, formal, and efficient. Part III now presents a design of the suggested new system, including the specifications for implementation of the above recommendations.

Part III: PLAN FOR A NEW COMMUNICATIONS/INFORMATION SYSTEM

- 1.0 Preface
  - 1.1 Introduction
  - 1.2 Contents
- 2.0 Management Abstract
  - 2.1 New System Recommendations
  - 2.2 System Value and Advantages
  - 2.3 Present System Description (Summary of Part I)
  - 2.4 System Requirements (Summary of Part II)
  - 2.5 New System Operation
    - 2.5.1 Administrative Information System
    - 2.5.2 Planning Information System
- 3.0 The New System in Operation
  - 3.1 Information Flow
    - 3.1.1 Administrative Information System
    - 3.1.2 Planning Information System
    - 3.1.3 Printing Activity
  - 3.2 Equipment Configuration
  - 3.3 Organization, Skills, and Personnel
- 4.0 Additional Comments: The New Communication Chain
  - 4.1 Centralized Office Space
  - 4.2 Regular Staff Meetings
  - 4.3 Office Management Practices
  - 4.4 Extra-Ministerial Communications
  - 4.5 Correspondence Control System

4.6 Radio Communications System

4.7 Transportation System

4.8 Conferences/Congresses

4.9 Newsletter

4.10 Miscellaneous Suggestions

1.0 PREFACE

1.1 Introduction

This part -- the plan for a new Communications/Information System -- presents the general design of such a system for the Bolivian educational system. The design considers the district level -- rural and urban -- as well as the national level (Ministry of Education), making use of the new computer system which will be available to the centralized governmental agencies through CENACO. However, the design may be oriented to manual operations as well, the main difference being that a lower volume of selected data would be processed to provide effective, timely, and meaningful information.

The design objective permits the proper flow of information and assures the availability and movement of adequate information content to users within the Bolivian educational system.

1.2 Contents

This part contains three principal sections: The management abstract, a description of the new system in operation, and the concluding "Additional Comments" section.

1.2.1 Management Abstract

This section presents a recommended course of action regarding the new system and an appraisal of the system advantages and benefits.

A brief review of Parts I and II is given.

The highlights, characteristics, and a profile of the new system in operation is provided. As a final part to this section, a preliminary timetable and cost estimates associated with development and implementation are presented.

1.2.2 The New System in Operation

This section describes in more detail the operational aspects of the new system. These aspects are presented under three headings: Information flow, equipment configuration, and organization, skills, and personnel.

1.2.3 Additional Comments

The final section deals with other aspects of the Communications/ Information System which -- while critical to a balanced, inclusive System -- fall outside the area of computerization.

2.0 MANAGEMENT ABSTRACT

2.1 New System Recommendations

Following a thorough analysis and evaluation of the present communications/information system within the Ministry of Education and the Bolivian Educational system in general, it is recommended that the principal activities which comprise the communications/information system be mechanized through the new computers to be acquired by CENACO (National Computing Center).

Further, it is recommended that the new communications/information system be considered from two distinct, but related aspects. The first refers to the technical and administrative provisions needed to collect and deliver information for its timely use -- thus, the management of information. In this aspect, the system would manage information for routine administrative control of the educational system and would be referred to as the Administrative Information System. The second aspect refers to the use of information for management -- i.e., the refinement and interpretation of information for its application to the management process. In this aspect, the system would provide information, obtained from statistical data, for better evaluation, decision-making, planning, and control of the educational system's operations. This will be referred to as the Planning Information System. In both systems, the underlying concern is the better use of data and information in the operation of the Bolivian educational system.

Both systems may be considered as a management tool which will support and strengthen many aspects of operation in the planning and administrative areas of the educational system.

With respect to these systems, it is recommended that both the Administrative Information System and the Planning Information System be developed together.

In order to bring the remotely located data to the central processing area and the central files, the use of remote data terminals is recommended. At the national level, there would be several terminals installed in the Ministry of Education. They would be accessible to the different activities (salaries, personnel, assets, budget control, and inventory and distribution) which comprise the Administrative Information System. At the departmental (i.e., district) level -- urban and rural -- one terminal would be installed in the SIDA office. In this way, all the activities (salaries, personnel, assets, costs, and scholastic data-collection) at the district level would have access to the terminal.

2.2 System Value and Advantages

The new system would provide several distinct advantages and benefits. Among these are the following:

2.2.1 Decentralize activity operations at the district and national levels.

2.2.2 Eliminate repetitive data flows from the interior districts to the national level.

2.2.3 Centralize into one communications channel all data flows from the districts to the national level.

2.2.4 Make information and data timelier, more accurate, and more meaningful.

2.2.5 Provide a wider range and greater depth of information for operating planning, and policy-making decisions and functions.

2.2.6 Free the teachers, supervisors, and administrators from administrative functions and details which currently take much of their available time. As a result, they could devote more time to the technical/pedagogical aspects of their job.

2.3 Present System Description (Summary of Part I)

The present communications/information systems are characterized by the lack of timely, accurate and available information. The data used at the national level comes from the district level through several independent data channels.

Information for the purposes of planning and policy-making at the national level is practically non-existant; what is available is inaccurate, very late, incomplete, and in formats which are difficult to use. The communication channels used between the district level and the national level are primarily the post office system, overland and air mail, and traveling personnel who hand-carry information. The average time delay is more than one week.

At the national level, communication channels consist of messengers hand-carrying information between offices and departments, with an average delay-time of 2 to 3 days.

Contributing to the above conditions are several factors, some of which are indicated below:

- Administrative departments and offices are distributed among eight widely separated buildings.
- Telephone communication is limited to 10 units among 29 offices and 162 people.
- Administrative functions and operations are centralized at the national level. However, at this level, they are distributed

among a large number of offices; as a consequence, operations are duplicated, ineffective and -- in many cases -- incomplete.

- Some departments do not distribute or disseminate data or information to other departments which could use it.
- There is a notable lack of information-users for the purposes of routine administrative operations and for the evaluation, decision-making, planning, and control operations of the educational system.

2.4 System Requirements - (Summary of Part II)

To determine the communication/information system requirements, the activities identified in the analysis of the present system were realigned and synthesized into a few basic activities.

The basic activities were identified as follows:

- Salaries
- Personnel
- Assets
- Inventory and distribution
- Information
- Budget Control
- Printing

The activities were described and defined in terms of their goals and objectives, scope and boundary, and related considerations, without separating them into national or district levels. However, some activities are applicable at the national level only -- e.g., Inventory and Distribution, Budget Control, and Printing.

For each activity, the input, output, operational and resource requirements were determined at both national and district levels, where applicable. In this section, only the goals and scope of each basic activity are presented.

2.4.1 Activity - Salaries

This activity will prepare salaries for over 43,000 persons in the Bolivian educational system. It shall handle all details, from receipt of pertinent data and forms, to the distribution of Payment Vouchers to personnel.

2.4.2 Activity - Personnel

This activity will maintain a permanent personal, professional, and service/work record for over 43,000 persons within the Bolivian educational system. It will continously update the records and provide information to personnel for certification purposes.

2.4.3 Activity - Assets

This activity will maintain a permanent and verified record of all assets in the entire Bolivian education system. The assets comprise over 8,000 buildings and many thousands of items within the buildings. The records will have cost data.

2.4.4 Inventory and Distribution

This activity will maintain a permanent record of all food items received and distributed throughout the Bolivian education system.

The records and control of all food items (9 separate items) and scholastic materials (220 separate items) shall be handled at the national level.

The records and control of all supply items shall be handled at the national level; these items number 78 and are for consumption in the Ministry of Education only.

2.4.5 Activity - Information

This activity will provide overall information on the educational system to users at the national level, for operational, planning, and policy-making purposes. It will also provide district information to users at the district level, for operational and planning purposes.

The information shall include the following:

- Personnel
- Salaries
- Assets
- Schools
- Students
- Activities
- Finances
- Inventory and distribution

2.4.6 Activity - Budget Control

This activity will maintain a record of all expenditures made against the educational budget. In addition, it shall exercise control over the budget.

This activity shall be part of the national level financial activity.

2.4.7 Activity - Printing

This activity shall provide all the printing services required by the national level (Ministry of Education). The cost of the printing service must be equal or less than that provided by similar outside, commercial services.

The Administrative Information System includes the following activities:

- Salaries
- Personnel
- Assets
- Inventory and Distribution
- Budget Control

(The printing activity, due to its nature, is not an active part of either the Administrative Information System or the Planning Information System. However, it would provide some data which would be used by the Budget Control Activity.)

The Planning Information System would utilize data from the Administrative Information System, plus data identified in the Information activity.

2.5. New System Operation

As was noted in Section 2.1, the new system is considered as two distinct, but interrelated systems. The first is the Administrative Information System, which deals with the routine administrative use of information. The second is the Planning Information System, which deals with the application of statistical information to the planning and evaluation processes.

For each system, the highlights, characteristics, and a general profile is provided. For the Administrative Information System, a preliminary timetable and the estimated costs associated with development and implementation are presented. The Planning Information System would be developed and implemented in the same time frame as the Administrative Information System. However, estimating the associated costs for this system is very difficult at this time and must await final approval for design and implementation. However, some of the tasks required for its development are presented.

2.5.1 Administrative Information System

2.5.1.1 Highlights and Characteristics

This system will be responsible for data flows from the school level through the supervisory level, to the district office level, and for data flows from the Ministry offices and departments to data centers in the Ministry. The data flows must be prompt and precise. The principal activities included in this system are:

- Salaries
- Personnel
- Assets
- Inventory and distribution
- Finances (including budget control)

These activities -- though operationally independent -- are highly interdependent from the Administrative Information System point of view.

At the national level, the system maintains these activities operationally independent, but unites them informationally through the use of central files. At the district level, the activities will be operationally centralized in the SIDA office; again, the activities shall be united informationally through the use of central files. The communications channel will also be centralized. Data will flow from the school level to the district office level, through the supervisory level.

The use of central files, which would be computerized, consolidates the existing independent files in each activity into one single file. This one file would contain the needed data for each activity, while avoiding data duplication. Under this arrangement, the administrative unit in charge of each activity would have access to only that data required for the performance of its specialized operations. This may be accomplished by the techniques of hierarchical storage, privacy, interrupts, and specialized access.

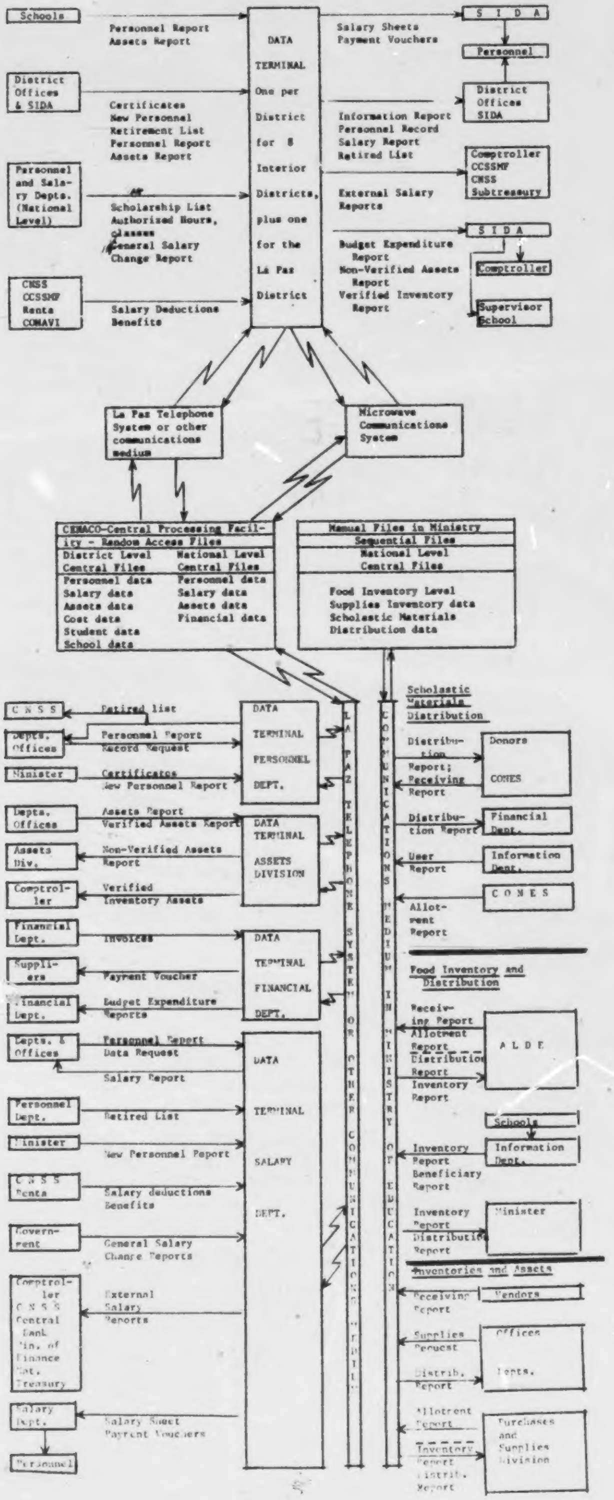
The Administrative Information System would deliver all the information needed -- but more rapidly, with more flexibility of use, and with elimination of the wasteful duplications of time and effort which are inherent in the present system.

2.5.1.2 Operational Profile

The operational profile of the Administrative Information System is given in Figure 2.5.1.2.1. It shows the activity data inputs and information outputs at the district level, as well as data sources and information destinations. The same is shown, by activity, at the national level and the respective terminals. The general characteristics and contents of the central files is provided. All activities -- except Food Inventory, Supplies Inventory, and Scholastic Materials Distribution -- will have computerized files. The inventory and distribution activities will have manual files, due to the low volume of data contained in them and the reduced updating requirements. Some of the various types of communications systems used in the transmission of data and information are indicated.

OPERATIONAL PROFILE OF THE ADMINISTRATIVE INFORMATION SYSTEM

FIGURE 2.5.1.2.1


Schools
Personnel Report
Assets Report
District Offices & SIDA
Certificates
New Personnel
Retirement List
Personnel Report
Assets Report
Personnel and Salary Depts. (National Level)
Scholarship List
Authorized Hours, classes
General Salary Change Report
CNSS
CCSSMF
Renta
COMAVI
Salary Deductions
Benefits
DATA TERMINAL One per District for 8 Interior Districts, plus one for the La Paz District
Salary Sheets
Payment Vouchers
S I D A
Personnel
District Offices SIDA
Information Report
Personnel Record
Salary Report
Retired List
Comptroller
CCSSMF
CNSS
Subtreasury
External Salary Reports
S I D A
Comptroller
Supervisor School
Budget Expenditure Report
Non-Verified Assets Report
Verified Inventory Report
La Paz Telephone System or other communications medium
Microwave Communications System
CEMACO-Central Processing Facility - Random Access Files
District Level Central Files
National Level Central Files
Personnel data
Salary data
Assets data
Cost data
Student data
School data
Personnel data
Salary data
Assets data
Financial data
Manual Files in Ministry
Sequential Files
National Level
Central Files
Food Inventory Level
Supplies Inventory data
Scholastic Materials
Distribution data
LA PAZ TELEPHONE SYSTEM OR OTHER COMMUNICATIONS MEDIUM
COMMUNICATIONS MEDIUM IN MINISTRY OF EDUCATION
C N S S
Retired list
Depts. Offices
Personnel Report
Record Request
Minister
Certificates
New Personnel Report
DATA TERMINAL PERSONNEL DEPT.
Depts. Offices
Assets Report
Verified Assets Report
Assets Div.
Non-Verified Assets Report
Comptroller
Verified Inventory Assets
DATA TERMINAL ASSETS DIVISION
Financial Dept.
Invoices
Suppliers
Payment Voucher
Financial Dept.
Budget Expenditure Reports
DATA TERMINAL FINANCIAL DEPT.
Depts. & Offices
Personnel Report
Data Request
Salary Report
Personnel Dept.
Retired List
Minister
New Personnel Report
C N S S Renta
Salary deductions
Benefits
Government
General Salary Change Reports
Comptroller C N S S Central Bank Min. of Finance Nat. Treasury
External Salary Reports
Salary Dept.
Salary Sheet
Payment Vouchers
Personnel
DATA TERMINAL SALARY DEPT.
Scholastic Materials Distribution
Distribution Report; Receiving Report
Donors
CONES
Distribution Report
Financial Dept.
User Report
Information Dept.
C O N E S
Allotment Report
Food Inventory and Distribution
Receiving Report
Allotment Report
Distribution Report
Inventory Report
A L D E
Schools
Information Dept.
Inventory Report
Beneficiary Report
Inventory Report
Distribution Report
Minister
Inventories and Assets
Receiving Report
Vendors
Supplies Request
Distrib. Report
Offices
Depts.
Allotment Report
Inventory Report
Distrib. Report
Purchases and Supplies Division

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2.5.1.3 Preliminary Timetable

A preliminary timetable is presented for the development and implementation of the Administrative Information System. The timetable is given in Figure 2.5.1.3 and is divided into seven phases, as follows:

- Phase A
- Phase B
- Phase C
- Phase D-1
- Phase D-2
- Phase D-3
- Phase D-4

PRELIMINARY DEVELOPMENT AND IMPLEMENTATION TIMETABLE OF THE ADMINISTRATIVE INFORMATION SYSTEM

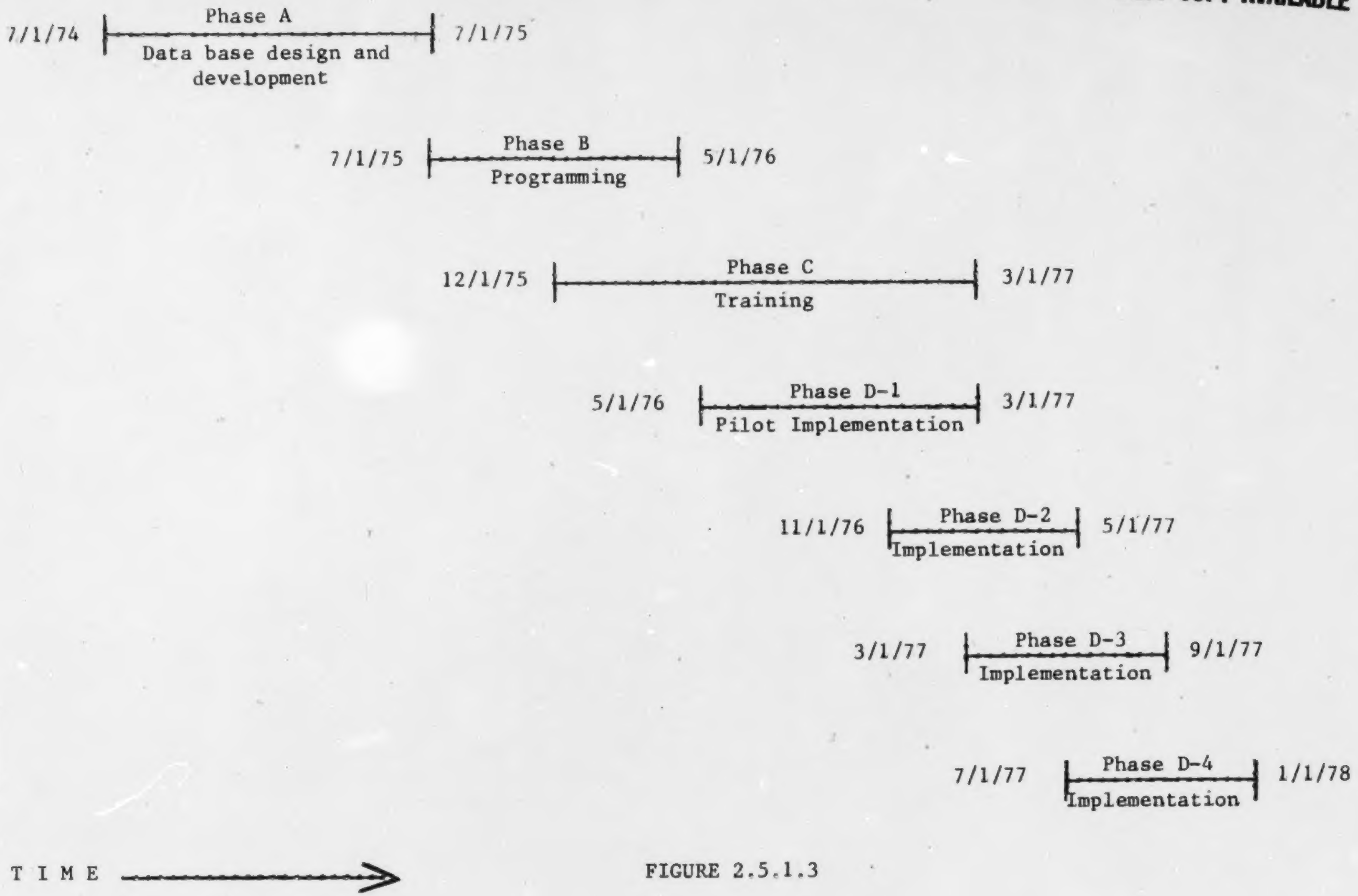


FIGURE 2.5.1.3

2.5.1.3.1 Phase A

This phase is the design and development of the data base for administrative information. It comprises the following principal tasks.

2.5.1.3.1.1 Design forms and procedures for data collection.

2.5.1.3.1.2 Establish and specify data sources, information users, and data/information channels.

2.5.1.3.1.3 Formulate, in detail, data/information requirements for the administrative function at the national and district levels.

2.5.1.3.2 Phase B

This phase is one of data-base programming and initial data-collection and includes two main tasks.

2.5.1.3.2.1 Design the central data banks for data storage and retrieval.

2.5.1.3.2.2 Prepare and test the computer application programs.

2.5.1.3.3 Phase C

This phase comprises the training of personnel to use the Administrative Information System. Persons from the Ministry of Education and the districts would be trained.

2.5.1.3.4 Phase D-1

This phase is the pilot implementation of the system in La Paz. It would include the Ministry of Education and the departmental district of La Paz. During this phase, the system would be tested, prior to its routine implementation and use in the other districts. This pilot phase would also be used as a vehicle for some of the training activities.

2.5.1.3.5 Phase D-2

This phase would include implementing the tested system in the departmental districts of Cochabamba, Santa Cruz, and Oruro, by establishing the respective computer data terminals with microwave data links to the CENACO computer in La Paz.

2.5.1.3.6 Phase D-3

This phase would include implementing the tested system in the departmental districts of Chuquisaca, Tarija and Potosi by establishing the respective computer data terminals, etc. as in phase D-2.

2.5.1.3.7 Phase D-4

This phase would include implementing the tested system in the departmental districts of Pando and Beni. It would include the same items as in Phases D-2 and D-3.

2.5.1.4 Cost Estimates

Cost estimates are given in Figures 2.5.1.4.1, 2.5.1.4.2 and 2.5.1.4.3. Figure 2.5.1.4.1 gives physical requirements by phase, according to the categories: Technical Assistance (for development, test, and implementation of the system), Training(manpower, and other costs to train the system users), Travel, Per-Diem, Materials, Equipment Rental(computer time and data-transmission line rental), Equipment Purchase (remote computer data terminals), and Equipment Maintenance.

Figure 2.5.1.4.2 gives per-unit costs for the various physical inputs.

Figure 2.5.1.4.3 summarizes total costs, giving a grand total of $561,972 over the three and one half years of the project.

PHYSICAL REQUIREMENTS BY PHASE

PHASE	TECH. ASSIST. (MAN-DAYS)	TRAINING (MAN-DAYS)	TRAVEL (ROUND-TRIPS)	PER-DIEM (DAYS)
A	132-Type A (Note 1) 198-Type B 44-Type C		16-Type A (Note 2) 2-Type B (Note 3)	180-Type A (Note 5) 60-Type B
B	132-Type A 660-Type B 660-Type D 132-Management Support		8-Type A (Note 4)	56-Type A
C		485-Type B	32-Type A (Note 8)	480-Type A (Note 10)
D-1	440-Type A (Note 6) 220-Type B			
D-2	132-Type A (Note 6) 132-Type B (Note 6)		10-Type A (Note 9)	360-Type A (Note 11)
D-3	132-Type A (Note 6) 132-Type B (Note 6)		10-Type A (Note 9)	360-Type A (Note 11)
D-4	88-Type A (Note 7) 88-Type B (Note 7)		7-Type A (Note 9)	360-Type A (Note 11)

FIGURE 2.5.1.4.1/p.1

(See Figure 2.5.1.4.2 and Notes for Explanation)

PHYSICAL REQUIREMENTS BY PHASE

PHASE	MATERIALS, ETC.	EQUIPMENT RENTAL	EQUIPMENT PURCHASE	EQUIPMENT MAINTENANCE
A	$500 (Materials) $500 (Office help)			
B	$1840 (Materials)	$10,400=(40x10x26) (Note 12)		
C	$800 (Materials)	$3440=(40x2x43) (Note 12)		
D-1	$500 (Materials) 10 Districts-Months (Note 13)	$8600=(40x5x43) (Note 12)	6 Terminals-Type A	60 Terminal-Months, Type A
D-2	$1000 (Materials) 20 District-Months (Note 13)	$8300=(50x5x26) +(40x5x9) (Notes 12,14)	3 Terminals-Type B (Note 15)	12 Terminal-Months, Type A 18 Terminal-Months, Type B
D-3	$1700 (Materials) 34 District-Months (Note 13)	$14,600=(50x5x44) +(40x5x18) (Notes 12,14)	3 Terminals-Type B (Note 15)	12 Terminal-Months, Type A 30 Terminal-Months, Type B
D-4	$2000 (Materials) 40 District-Months (Note 13)	$19,100=(50x5x62) +(40x5x18) (Notes 12,14)	2 Terminals-Type B (Note 15)	12 Terminal-Months, Type A 36 Terminal-Months, Type B

FIGURE 2.5.1.4.1/p.2
(See Figure 2.5.1.4.2 and Notes for Explanations)

DEFINITION OF UNIT COSTS

MAN-DAYS - Type A (Local Computer-Systems Expert)	$ 80 /day
MAN-DAYS - Type B (Local Analyst - Programmer or Trainer)	$ 40 /day
MAN-DAYS - Type C (Exterior Consultant)	$ 150 /day
MAN-DAYS - Type D (Programmer)	$ 16 /day
MANAGEMENT SUPPORT (during programming efforts)	$ 40 /day
TRAVEL - Type A (Within Bolivia)	$ 40 / RT
TRAVEL - Type B (International)	$ 800 / RT
PER-DIEM - Type A (Bolivia personnel)	$ 17 /day
PER-DIEM - Type B (International personnel)	$ 22/ day
TERMINAL PURCHASE - Type A (For use in La Paz)	$ 6,500
TERMINAL PURCHASE - Type B (For outside La Paz)	$ 25,000
TERMINAL MAINTENANCE - Type A	$ 70/Month
TERMINAL MAINTENANCE - Type B	$ 270/Month

FIGURE 2.5.1.4.2

SUMMARY OF TOTAL COST (IN DOLLARS)

(Sub-totals correspond to Figure 2.5.1.4.1 Last line in each gives total for cell.)

PHASE	Technical Assistance	Training	Travel	Per-Diem	Materials etc.	Equipment Rental	Equipment Purchase	Equipment Maintenance	PHASE TOTAL
A	10,560 7,920 6,600 ======= 25,080	0	640 1.600 ===== 2,240	3.060 1.320 ===== 4,380	500 500 ===== 1,000	0	0	0	31,960
B	10,560 26,400 10,560 5,280 ======= 52.800	0	320	952	1.840	10.400	0	0	66.112
C	0	19,400	1.280	8.160	800	3,440	0	0	31,000
D-1	35,200 8,800 ====== 44,000	0	0	0	500	8,600	39,000	4,200	96.300
D-2	10,560 5,280 ====== 15,840	0	400	6,120	1,000	8,300	75,000	840 4,860 ===== 5,700	110,660
D-3	10,560 5,280 ====== 15,840	0	400	6,120	1,700	14,600	75,000	840 8,100 8,940	120,900
D-4	7,040 3,520 ====== 10,560	0	280	6,120	2,000	19,100	50,000	840 9,720 ===== 10,560	96,890
TOTALS	164.120	19,400	4,920	31,852	8,840	64,440	239,000	29,400	561,972

FIGURE 2.5.1.4.3

The cost estimates given are first approximations, based on present conceptions of system design, timing, effort required, and unit costs. These estimates must be refined later, should development and implementation of the Administrative Information System become a reality.

The contents of the Figures will be better understood through the following notes, to which reference is made in Figure 2.5.1.4.1

Note 1 The types of technical assistance man-days are defined in Figure 2.5.1.4.2.

Note 2 Two round-trips to each district outside La Paz.

Note 3 Two international round-trips.

Note 4 One round-trip to each district outside La Paz.

Note 5 One man traveling through the districts, full-time, for six months.

Note 6 Full-time for the indicated period.

Note 7 Reduced total man-days spread over the six-month period, because only two districts are to be covered.

Note 8 Two round-trips to La Paz for two people from each district.

Note 9 Estimate to cover adequate travel among the districts.

Note 10 30 days total for each of two people from each district, in two stages of 15 days.

Note 11 Full-time travel for two technical advisors for six months.

Note 12 Computer time rental is computed here as (hourly rate x hours per week x weeks). In La Paz, the hourly rate is estimated at $40. Outside, $50 is used, to allow for cost of the microwave data link.

Note 13 $50 is allowed for materials, per month, for each district; this is mainly for computer paper, plus other minor necessaries.

Note 14 The cost estimates for computer time account for the new expense incurred in each phase and cover all computer time through to the end of the project.

Note 15 More elaborate and expensive terminals will be required for use outside La Paz, because of the need to fit with remote data-transmission capabilities.

2.5.2 Planning Information System

2.5.2.1 Highlights and Characteristics

The objective of this system will be to provide information on the entire Bolivian educational system for the purposes of improved evaluation, decision-making, planning, and control of the educational system's operations.

It will be responsible for supplying to the national and district levels information based on the data contained in the central files of the Administrative Information System.

The type of information that the system would provide will include the following:

- Salaries
- Personnel
- Assets
- Financial
- Schools
- Students
- Costs
- Combinations of the above

At the district level, the SIDA office would be responsible for providing information and operating the system. The information provided would be only that which pertains to and/or concerns the district.

At the national level, the existing Statistics Department in Educational Planning, which is described in its new role in Section 3.3.1, would be responsible for providing information and for the overall operation and maintenance of the system. The national level would have access to the data in all the central files of the Administrative Information System.

The emphasis of the Planning Information System will be on creating a tool which the Ministry's planners will use.

2.5.2.2 Operational Profile

The operational profile of the Planning Information System is given in Figure 2.5.2.2.1.

The district and national level files used in this system are the same ones used by the Administrative Information System. Some of the various types of communications systems used in the transmission of data and information are indicated. From the profile, the data terminal in the Information Department will have access to all the central files, while the data terminal in the District SIDA office will have access to only the District Level central files.

OPERATIONAL PROFILE OF THE PLANNING INFORMATION SYSTEM

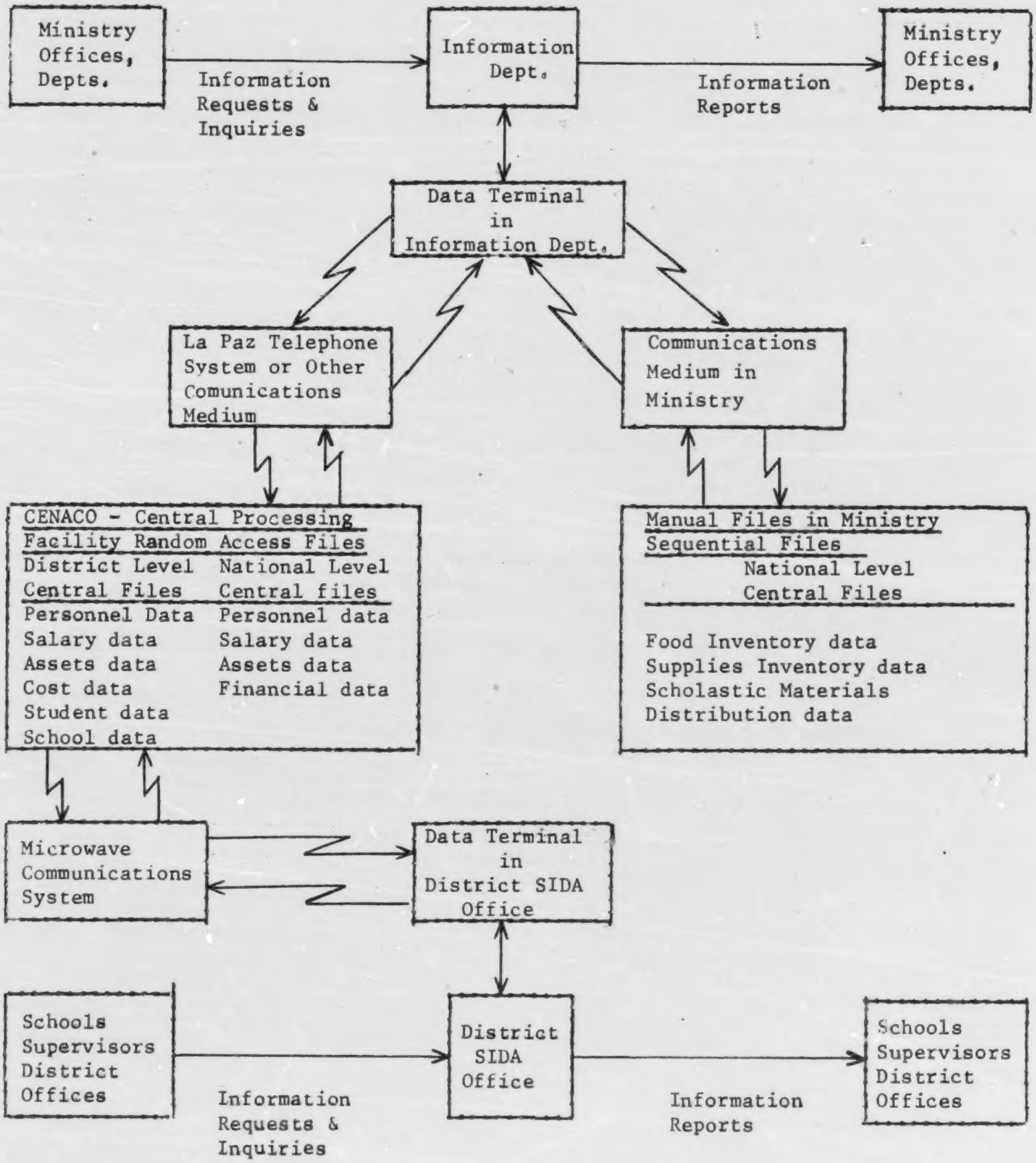

Ministry Offices, Depts.
Information Requests & Inquiries
Information Dept.
Information Reports
Ministry Offices, Depts.
Data Terminal in Information Dept.
La Paz Telephone System or Other Comunications Medium
Communications Medium in Ministry
CENACO - Central Processing Facility Random Access Files
District Level Central Files
Personnel Data
Salary data
Assets data
Cost data
Student data
School data
National Level Central files
Personnel data
Salary data
Assets data
Financial data
Manual Files in Ministry Sequential Files
National Level Central Files
Food Inventory data
Supplies Inventory data
Scholastic Materials Distribution data
Microwave Communications System
Data Terminal in District SIDA Office
Schools Supervisors District Offices
Information Requests & Inquiries
District SIDA Office
Information Reports
Schools Supervisors District Offices

FIGURE 2.5.2.2.1

2.5.2.3 Preliminary Timetable

The Planning Information System would be developed and implemented during the same time frame, three and one-half years, as the Administrative Information System.

2.5.2.4 Cost Estimates and Development Tasks

The costs for development and implementation of the Planning Information System are very difficult to estimate at this time and must await final approval for design and implementation.

However, some of the tasks which might be required in its development are as follows:

2.5.2.4.1 Analysis of the present use and availability of educational statistics for education.

2.5.2.4.2 Development of simple analyses based on existing data, for use in planning. The purpose would be to reduce large collections of statistics to more manageable and comprehensive forms.

2.5.2.4.3 Development and application of computer programs to carry out these analyses.

2.5.2.4.4 Definition of additional basic information needed to extend the use of quantitative information in planning.

2.5.2.4.5 Continued analysis of quantitative information.

2.5.2.4.6 Integration of basic data into the design of the central files.

3.0 THE NEW SYSTEM IN OPERATION

3.1 Information Flow

Information flow diagrams are provided for each activity of the Administrative Information System.

Generalized information flow diagrams are given for the Planning Information System.

A flow diagram is provided for the Printing activity, which is not part of the above systems, but which provides inputs to them.

3.1.1 Administrative Information System

The system includes the following activities, at both national and district levels:

- Salaries
- Personnel
- Assets

The national level activities are as follows:

- Budget control (financial)
- Inventory and distribution

The district level activities are as follows:

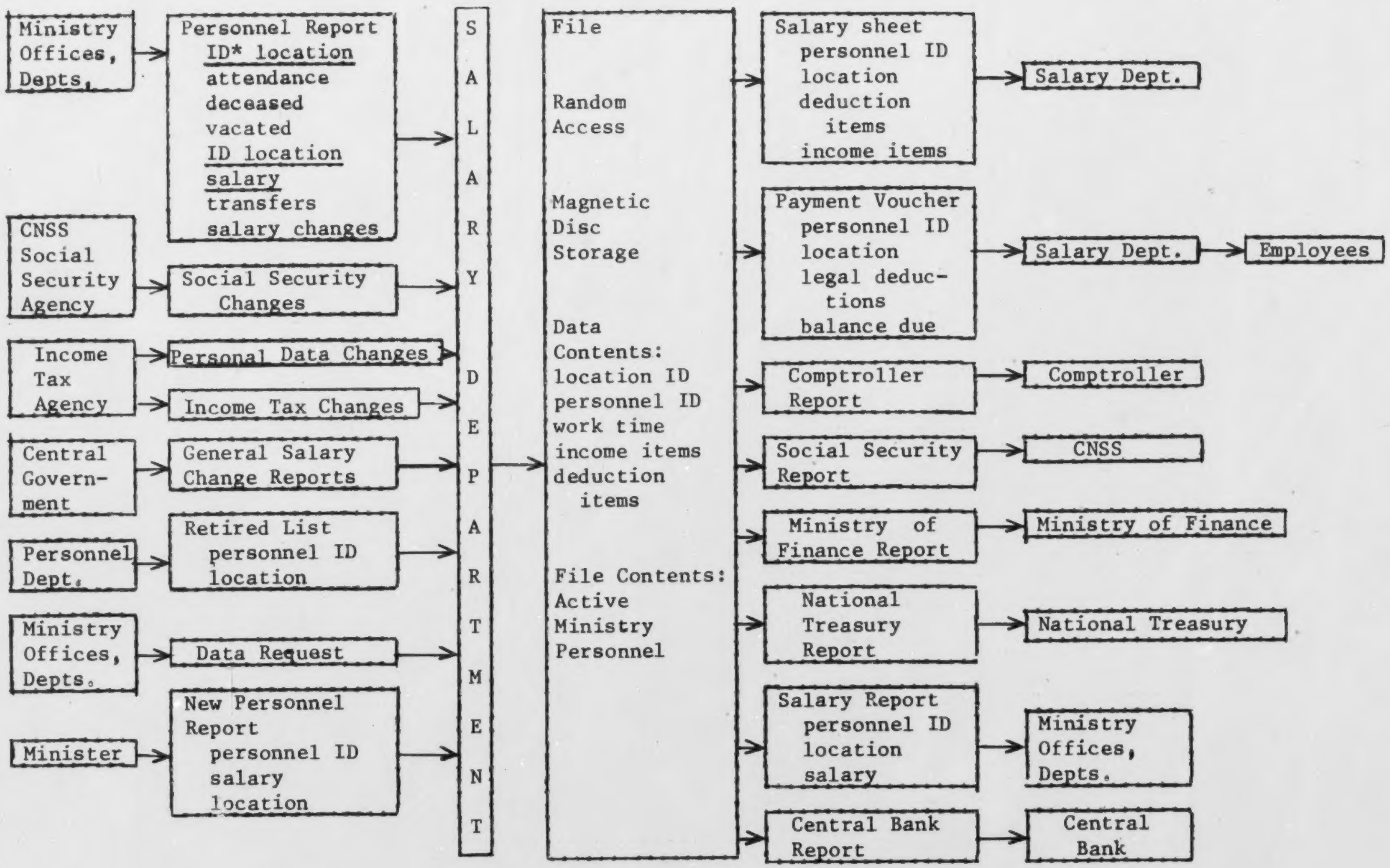
- Costs
- Scholastic data-collection

The flow diagrams show data sources and destination, type of input data and output information, and a general file design which includes data contents.

3.1.1.1 Salary Activity

The flow diagrams for the salary activity at the national and district levels are given in Figures 3.1.1.1.1 and 3.1.1.1.2 respectively. The file contents and data in both cases are the same. At the district level, all data inputs will be through the SIDA office. At the national level, the inputs will be through the Salary Department.

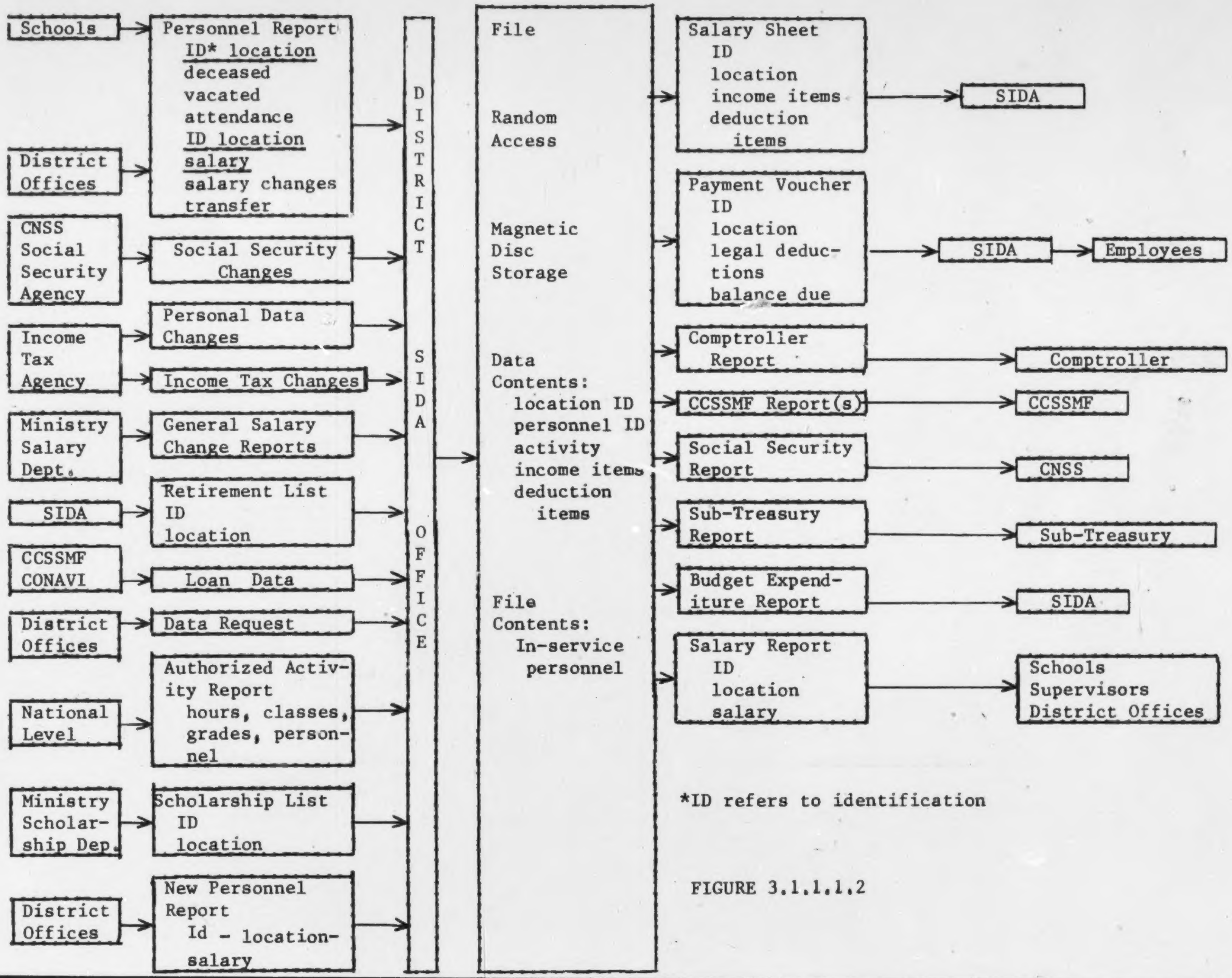
SALARIES - NATIONAL LEVEL


Ministry Offices, Depts.
Personnel Report
ID* location
attendance
deceased
vacated
ID location
salary
transfers
salary changes
CNSS Social Security Agency
Social Security Changes
Income Tax Agency
Personal Data Changes
Income Tax Changes
Central Govern-ment
General Salary Change Reports
Personnel Dept.
Retired List
personnel ID
location
Ministry Offices, Depts.
Data Request
Minister
New Personnel Report
personnel ID
salary
location
SALARY DEPARTMENT
File
Random Access
Magnetic Disc Storage
Data Contents:
location ID
personnel ID
work time
income items
deduction items
File Contents:
Active Ministry Personnel
Salary sheet
personnel ID
location
deduction items
income items
Salary Dept.
Payment Voucher
personnel ID
location
legal deduc-tions
balance due
Salary Dept.
Employees
Comptroller Report
Comptroller
Social Security Report
CNSS
Ministry of Finance Report
Ministry of Finance
National Treasury Report
National Treasury
Salary Report
personnel ID
location
salary
Ministry Offices, Depts.
Central Bank Report
Central Bank

*ID refers to identification

FIGURE 3.1.1.1.1

SALARIES - DISTRICT LEVEL


Schools
District Offices
CNSS Social Security Agency
Income Tax Agency
Ministry Salary Dept.
SIDA
CCSSMF CONAVI
District Offices
National Level
Ministry Scholarship Dep.
District Offices
Personnel Report ID* location deceased vacated attendance ID location salary salary changes transfer
Social Security Changes
Personal Data Changes
Income Tax Changes
General Salary Change Reports
Retirement List ID location
Loan Data
Data Request
Authorized Activity Report hours, classes, grades, personnel
Scholarship List ID location
New Personnel Report Id - location-salary
DISTRICT SIDA OFFICE
File
Random Access
Magnetic Disc Storage
Data Contents: location ID personnel ID activity income items deduction items
File Contents: In-service personnel
Salary Sheet ID location income items deduction items
Payment Voucher ID location legal deductions balance due
Comptroller Report
CCSSMF Report(s)
Social Security Report
Sub-Treasury Report
Budget Expenditure Report
Salary Report ID location salary
SIDA
SIDA
Employees
Comptroller
CCSSMF
CNSS
Sub-Treasury
SIDA
Schools Supervisors District Offices

*ID refers to identification

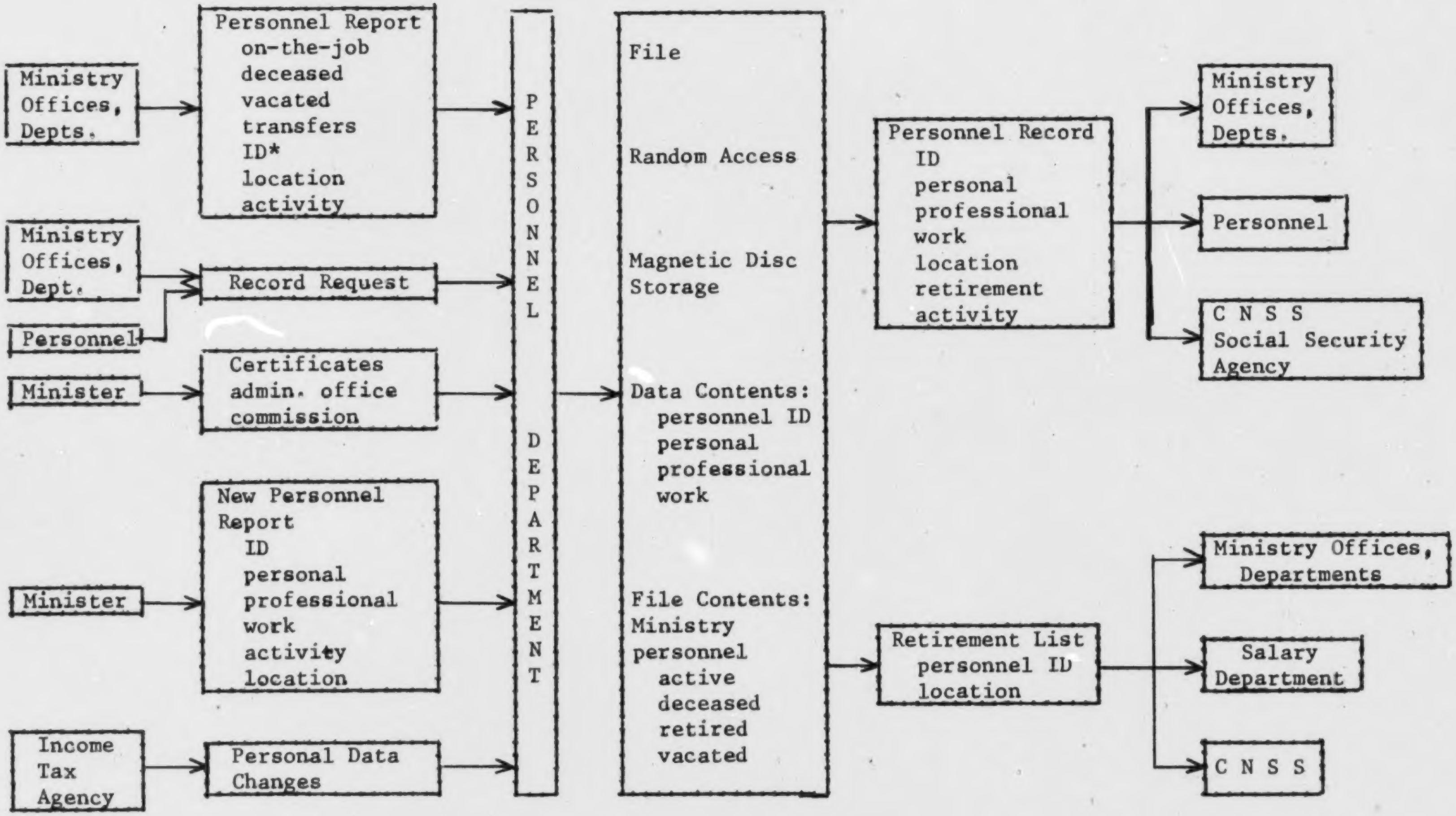
FIGURE 3.1.1.1.2

3.1.1.2 Personnel Activity

The flow diagrams for the personnel activity at the national and district levels are given in Figures 3.1.1.2.1 and 3.1.1.2.2, respectively. The file contents and data in both cases are the same. At the district level, all data inputs will be through the SIDA office. At the national level, the inputs will be through the Personnel Department.

The data contents in the files shall be based on certified data provided by the personnel.

PERSONNEL - NATIONAL LEVEL


Ministry Offices, Depts.
Personnel Report
on-the-job
deceased
vacated
transfers
ID*
location
activity
Ministry Offices, Dept.
Personnel
Record Request
Minister
Certificates
admin. office
commission
Minister
New Personnel Report
ID
personal
professional
work
activity
location
Income Tax Agency
Personal Data Changes
PERSONNEL DEPARTMENT
File
Random Access
Magnetic Disc Storage
Data Contents:
personnel ID
personal
professional
work
File Contents:
Ministry personnel
active
deceased
retired
vacated
Personnel Record
ID
personal
professional
work
location
retirement
activity
Ministry Offices, Depts.
Personnel
C N S S
Social Security Agency
Retirement List
personnel ID
location
Ministry Offices, Departments
Salary Department
C N S S

*ID refers to identification

FIGURE 3.1.1.2.1

PERSONNEL - DISTRICT LEVEL

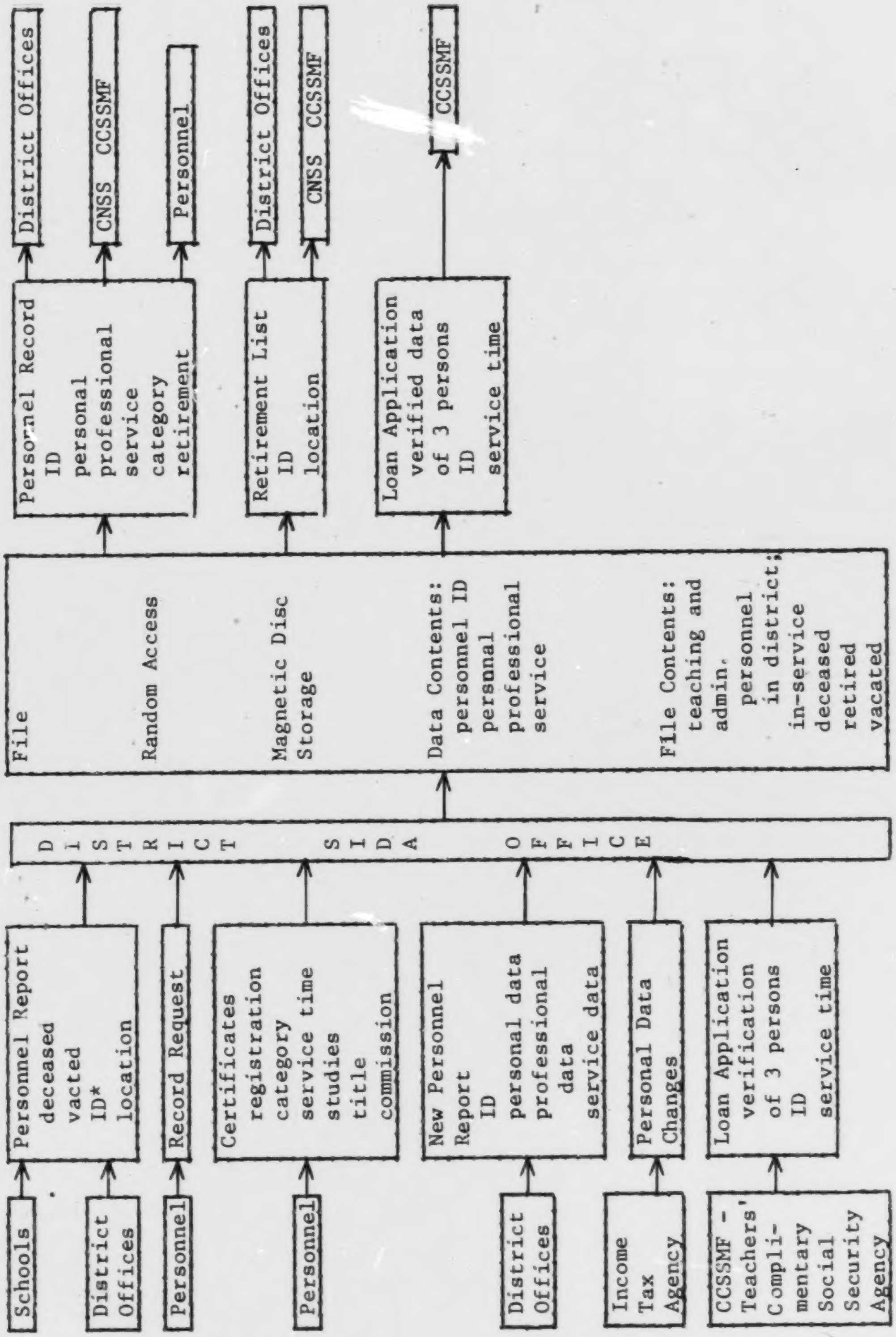

Schools
District Offices
Personnel
Personnel
District Offices
Income Tax Agency
CCSSMF - Teachers' Compli- mentary Social Security Agency
Personnel Report
deceased
vacted
ID*
location
Record Request
Certificates
registration
category
service time
studies
title
commission
New Personnel Report
ID
personal data
professional data
service data
Personal Data Changes
Loan Application
verification of 3 persons
ID
service time
D I S T R I C T
S I D A
O F F I C E
File
Random Access
Magnetic Disc Storage
Data Contents:
personnel ID
personal
professional
service
File Contents:
teaching and admin. personnel in district;
in-service
deceased
retired
vacated
Personnel Record
ID
personal
professional
service
category
retirement
Retirement List
ID
location
Loan Application
verified data of 3 persons
ID
service time
District Offices
CNSS CCSSMF
Personnel
District Offices
CNSS CCSSMF
CCSSMF

FIGURE 3.1.1.2.2

*ID refers to identification

In Figure 3.1.1.2.3, a preliminary design of the personnel file is provided. The design is applicable at the national and district levels. The design may be employed in a computerized or a manual environment.

The file description is as follows:

- All data will come under one of the following main headings: Identification, Personal, Professional, Work, and Service.
- The respective detail-data is indicated under each heading.
- The detail-data includes the following:

-Data item name;

-Number of characters per data item;

-Type of characters (A for alphanumeric and N for numeric);

-CODE indicates whether characters are in a code format;

-Additional information clarifying the data item, through the use of notes.

PRELIMINARY PERSONNEL FILE DESIGN - DISTRICT AND NATIONAL LEVELS

Identification Data

Code: 16, N, code, (Note 1)
National Identity Number: 7,N
Name: 25,A

PERSONAL DATA

Birthdate: 6,N
Sex: 1,N,code
Birthplace: 6,N,code (Note2)
Marital Status: 1, N, code

PROFESSIONAL DATA

Teaching Title: 2, N, code
Teaching Specialty: 2, N, code
Category: 1, N, code
Category Date: 6, N
Profession: 2, N, code
University Title: 2, N, code
Special Studies: 2, N, code

WORK DATA

Start Date: 6, N
Stop Date: 6, N
Organization Name: 25, A
Place: 6, N, code (Note 3)
Job Title: 2, N, code
Status: 1, N, code (Note 4)
Location: 2, N, code

SERVICE DATA

Year: 2, N
School Name: 25, A
Place: 6, N, code (Note 3)
Activity: 7, N, code (Note 5)
Job Title: 2, N, code
Status: 1, N, code (Note 4)

Note 1. A numerical code number is assigned to each person. It would be composed in the following manner:
- birthdate - 6 characters;
- initials of 2 first names and 2 last names - 8 characters in total;
- sex - 1 character;
- check digit - 1 character

This code number has the following advantages:
- Non-repetitive;
- Does not require memorization, as it can be reconstructed;
- In a computerized or manual environment, the check digit would verify the code and eliminate transcription errors.

Note 2. A numerical code is assigned for birthplace, as follows:
- Department - 2 characters
- Province - 2 characters
- Urban city - 2 characters

Note 3. A numberical code is assigned for geographical place of prior employment, as follows:
- Country or department - 2 characters
- Province - 2 characters
- Urban City - 2 characters

Note 4. A numberical code of one character is assigned to indicate status of employee or teacher, as follows:
- Deceased
- Retired
- Vacated
- On-the-job

Note 5. A numerical code is assigned to indicate the teacher's activity, as follows:
- Level - 2 characters
- Grade - 2 characters
- Subject - 2 characters
- Private or public - 1 character

FIGURE 3.1.1.2.3

.1.1.3 Assets Activity

The flow diagrams for the assets activity at the national and district levels are given in Figures 3.1.1.3.1 and 3.1.1.3.2 respectively.

The file contents and data are the same in both cases.

The differences between verified and non-verified data in the file and the reports are as follows:

- Non-verified data enters the file through the Assets Report.
- Non-verified data leaves the file through the Non-verified Assets Report. The data in this report is verified against supporting purchase, donation, legal, historical documents. At this point, the data becomes verified data.
- The verified data enters the file through the Verified Assets Report. The data in the file is coded or marked appropriately, to indicate that it is verified.

Personnel in the Assets Department and in the District or SIDA Offices will perform the required inspection tasks for verifying assets data.

ASSETS - NATIONAL LEVEL

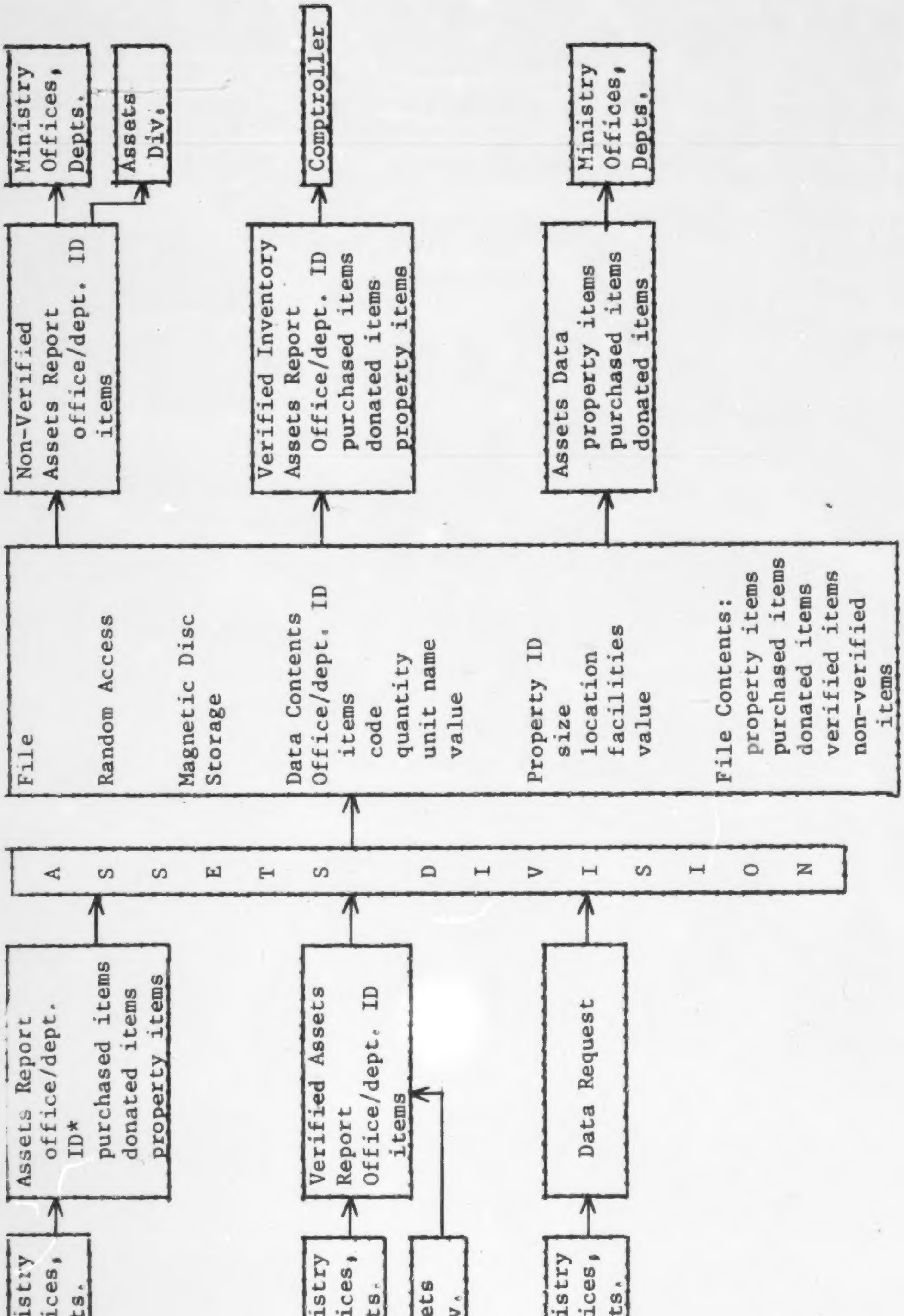

Ministry Offices, Depts.
Assets Report office/dept. ID* purchased items donated items property items
Ministry Offices, Depts.
Assets Div.
Verified Assets Report Office/dept. ID items
Ministry Offices, Depts.
Data Request
ASSETS DIVISION
File
Random Access
Magnetic Disc Storage
Data Contents Office/dept. ID items code quantity unit name value
Property ID size location facilities value
File Contents: property items purchased items donated items verified items non-verified items
Non-Verified Assets Report office/dept. ID items
Ministry Offices, Depts.
Assets Div.
Verified Inventory Assets Report Office/dept. ID purchased items donated items property items
Comptroller
Assets Data property items purchased items donated items
Ministry Offices, Depts.

FIGURE 3.1.1.3.1

*ID refers to identification

ASSETS - DISTRICT LEVEL

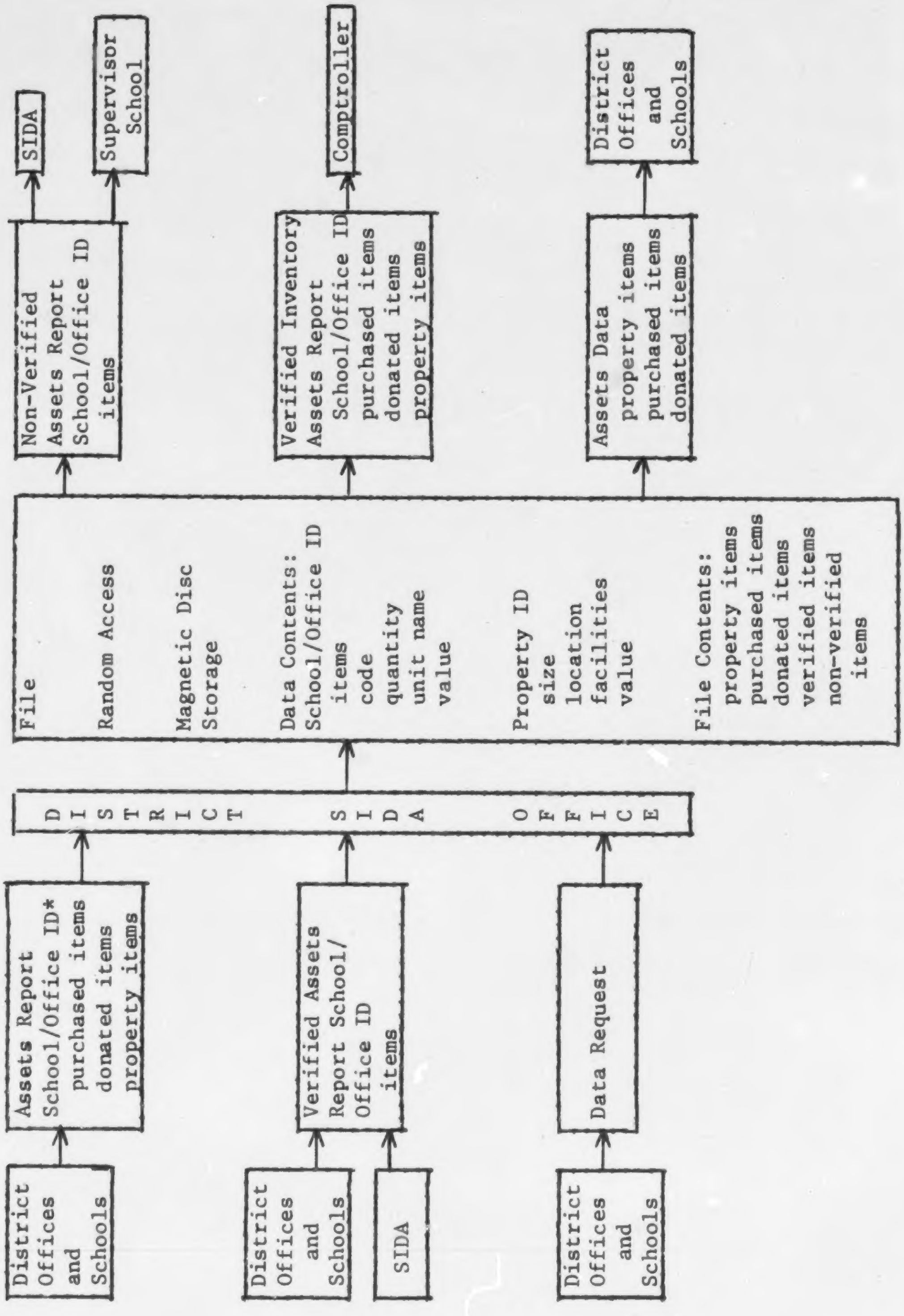

District Offices and Schools
Assets Report School/Office ID* purchased items donated items property items
District Offices and Schools
SIDA
Verified Assets Report School/ Office ID items
District Offices and Schools
Data Request
DISTRICT SIDA OFFICE
File
Random Access
Magnetic Disc Storage
Data Contents: School/Office ID items code quantity unit name value
Property ID size location facilities value
File Contents: property items purchased items donated items verified items non-verified items
Non-Verified Assets Report School/Office ID items
SIDA
Supervisor School
Verified Inventory Assets Report School/Office ID purchased items donated items property items
Comptroller
Assets Data property items purchased items donated items
District Offices and Schools

FIGURE 3.1.1.3.2

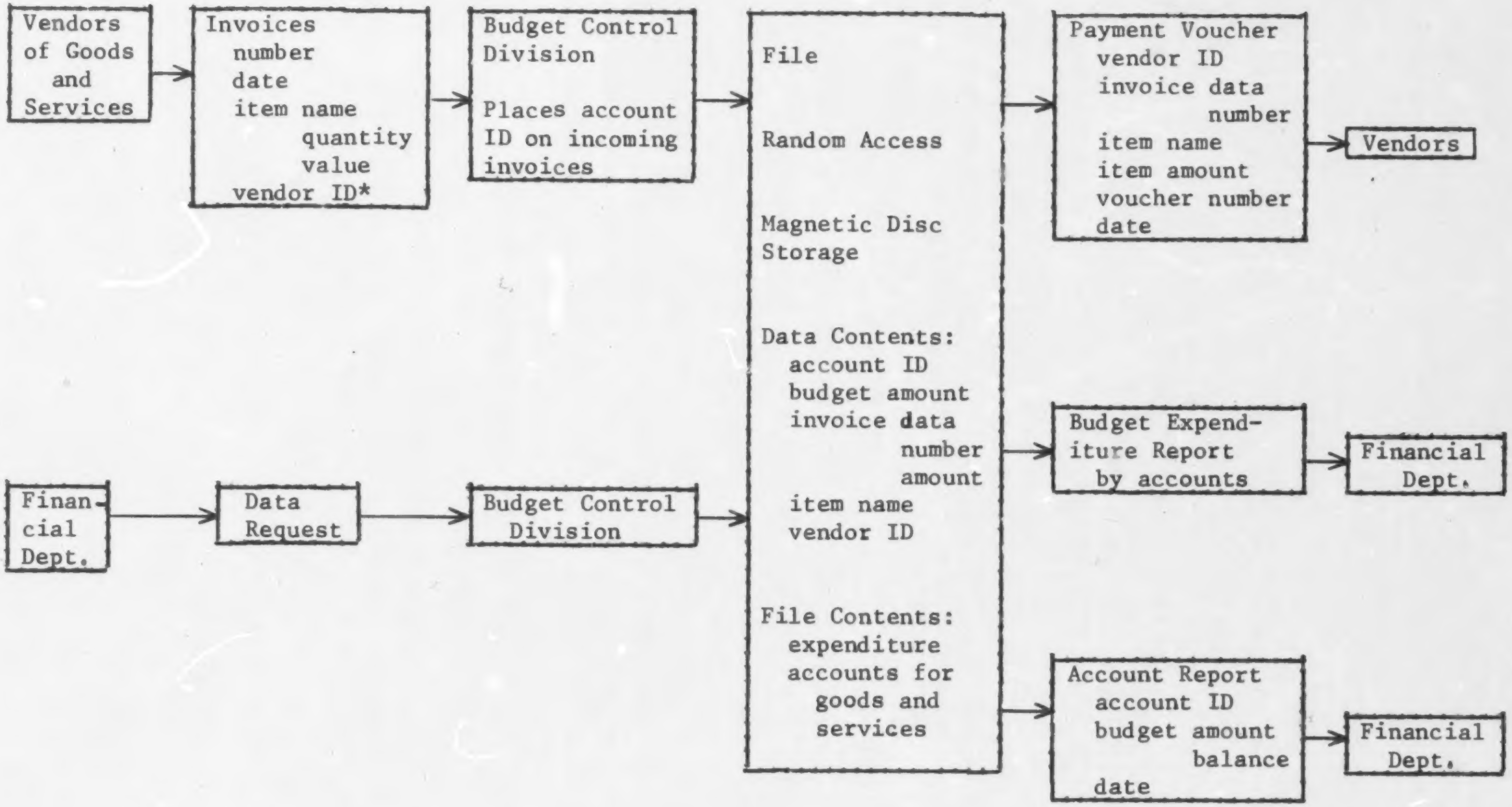
*ID refers to identification

3.1.1.4 Budget Control Activity

The flow diagram for the budget control activity is given in Figure 3.1.1.4.1. This activity operates only at the national level and is part of the financial activity.

As shown, this activity maintains budget control over goods and services only; however, it may also perform the same function for all expenditure items of the Ministry and districts.

BUDGET CONTROL - NATIONAL LEVEL


Vendors of Goods and Services
Invoices
number
date
item name
quantity
value
vendor ID*
Budget Control Division
Places account ID on incoming invoices
File
Random Access
Magnetic Disc Storage
Data Contents:
account ID
budget amount
invoice data
number
amount
item name
vendor ID
File Contents:
expenditure accounts for goods and services
Payment Voucher
vendor ID
invoice data
number
item name
item amount
voucher number
date
Vendors
Finan-cial Dept.
Data Request
Budget Control Division
Budget Expend-iture Report by accounts
Financial Dept.
Account Report
account ID
budget amount
balance
date
Financial Dept.

*ID refers to identification

FIGURE 3.1.1.4.1

3.1.1.5 Inventory and Distribution Activity

This activity comprises three flow diagrams for food inventory, supplies inventory, and scholastic materials distribution; these are given in Figures 3.1.1.5.1, 3.1.1.5.2, and 3.1.1.5.3 respectively. This activity operates at the national level only. The three files are manually handled and operated, because of the low volume in items and turnover which each represents.

Files on the food items and most of the scholastic materials do not have cost data, as these are donated items with pre-established destinations.

FOOD INVENTORY - NATIONAL LEVEL

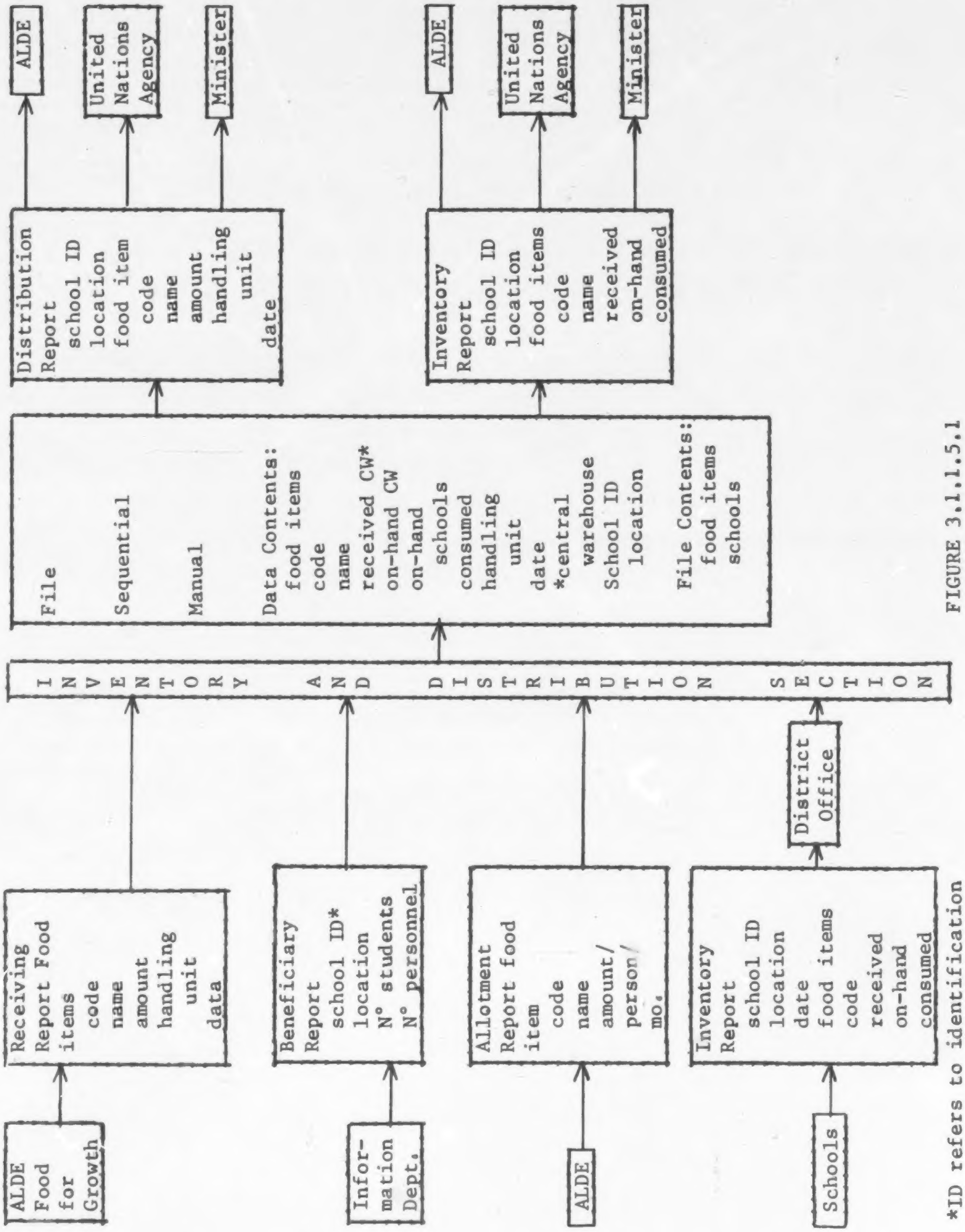
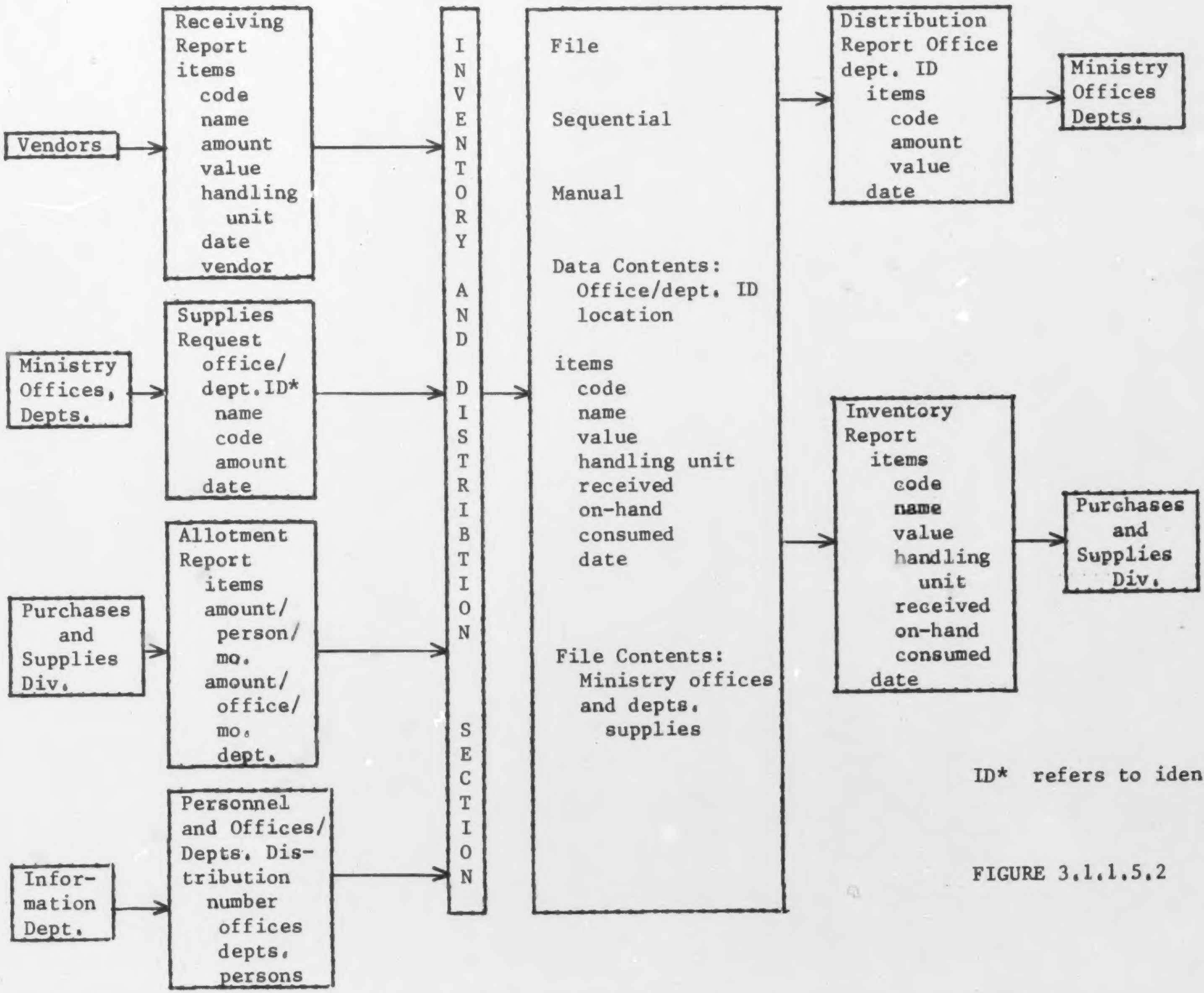

ALDE Food for Growth
Receiving Report Food items code name amount handling unit data
Infor-mation Dept.
Beneficiary Report school ID* location N° students N° personnel
ALDE
Allotment Report food item code name amount/ person/ mo.
Schools
Inventory Report school ID location date food items code received on-hand consumed
District Office
INVENTORY AND DISTRIBUTION SECTION
File
Sequential
Manual
Data Contents: food items code name received CW* on-hand CW on-hand schools consumed handling unit date *central warehouse School ID location
File Contents: food items schools
Distribution Report school ID location food item code name amount handling unit date
ALDE
United Nations Agency
Minister
Inventory Report school ID location food items code name received on-hand consumed
ALDE
United Nations Agency
Minister

FIGURE 3.1.1.5.1

*ID refers to identification

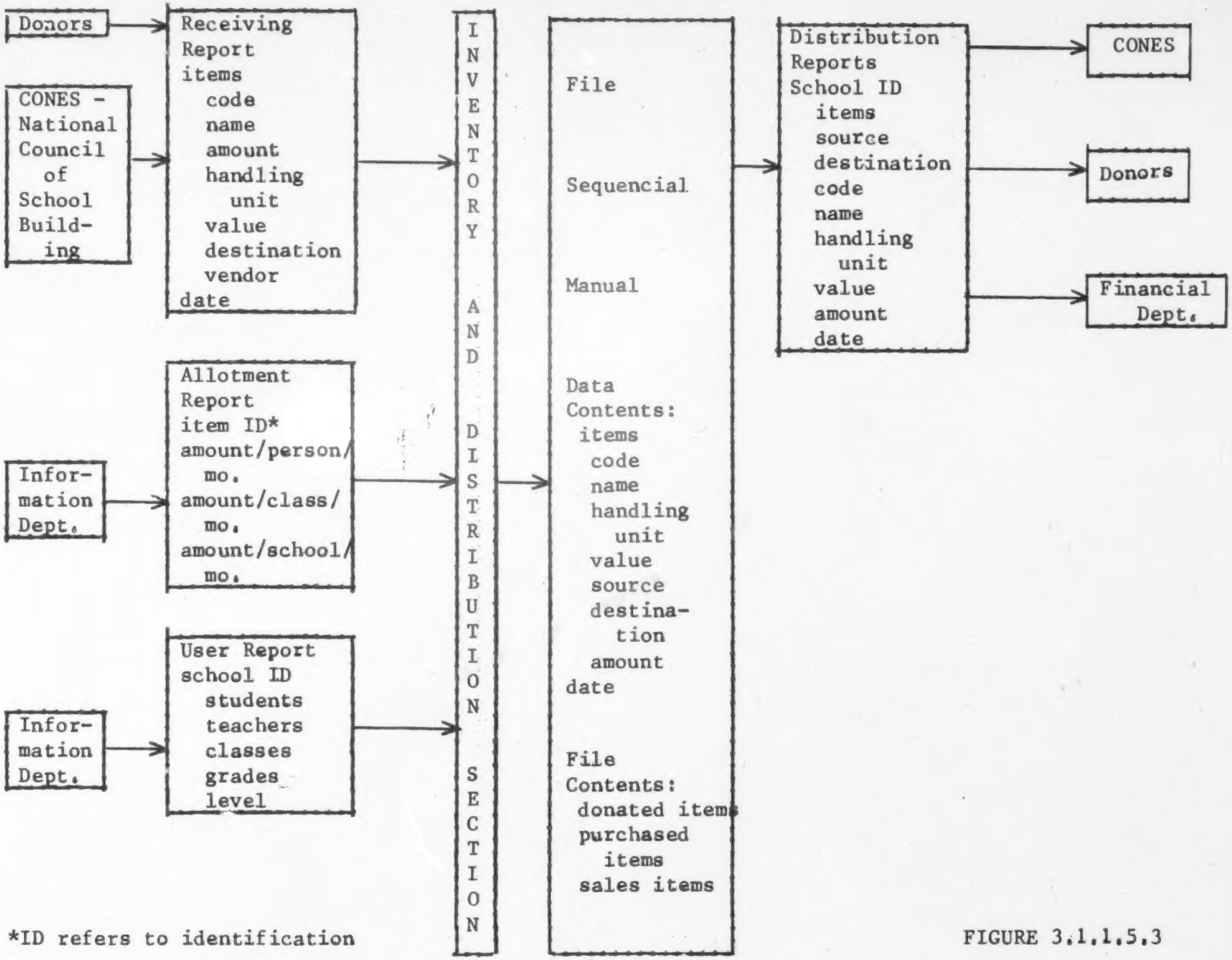
SUPPLIES INVENTORY - NATIONAL LEVEL


Vendors
Receiving Report items code name amount value handling unit date vendor
Ministry Offices, Depts.
Supplies Request office/ dept.ID* name code amount date
Purchases and Supplies Div.
Allotment Report items amount/ person/ mo. amount/ office/ mo. dept.
Information Dept.
Personnel and Offices/ Depts. Distribution number offices depts. persons
INVENTORY AND DISTRIBUTION SECTION
File
Sequential
Manual
Data Contents: Office/dept. ID location
items code name value handling unit received on-hand consumed date
File Contents: Ministry offices and depts. supplies
Distribution Report Office dept. ID items code amount value date
Ministry Offices Depts.
Inventory Report items code name value handling unit received on-hand consumed date
Purchases and Supplies Div.

ID* refers to identification

FIGURE 3.1.1.5.2

SCHOLASTIC MATERIALS DISTRIBUTION - NATIONAL LEVEL


Donors
CONES - National Council of School Building
Receiving Report
items
code
name
amount
handling unit
value
destination
vendor
date
Information Dept.
Allotment Report
item ID*
amount/person/mo.
amount/class/mo.
amount/school/mo.
Information Dept.
User Report
school ID
students
teachers
classes
grades
level
INVENTORY AND DISTRIBUTION SECTION
File
Sequencial
Manual
Data Contents:
items
code
name
handling unit
value
source
destination
amount
date
File Contents:
donated items
purchased items
sales items
Distribution Reports
School ID
items
source
destination
code
name
handling unit
value
amount
date
CONES
Donors
Financial Dept.

*ID refers to identification

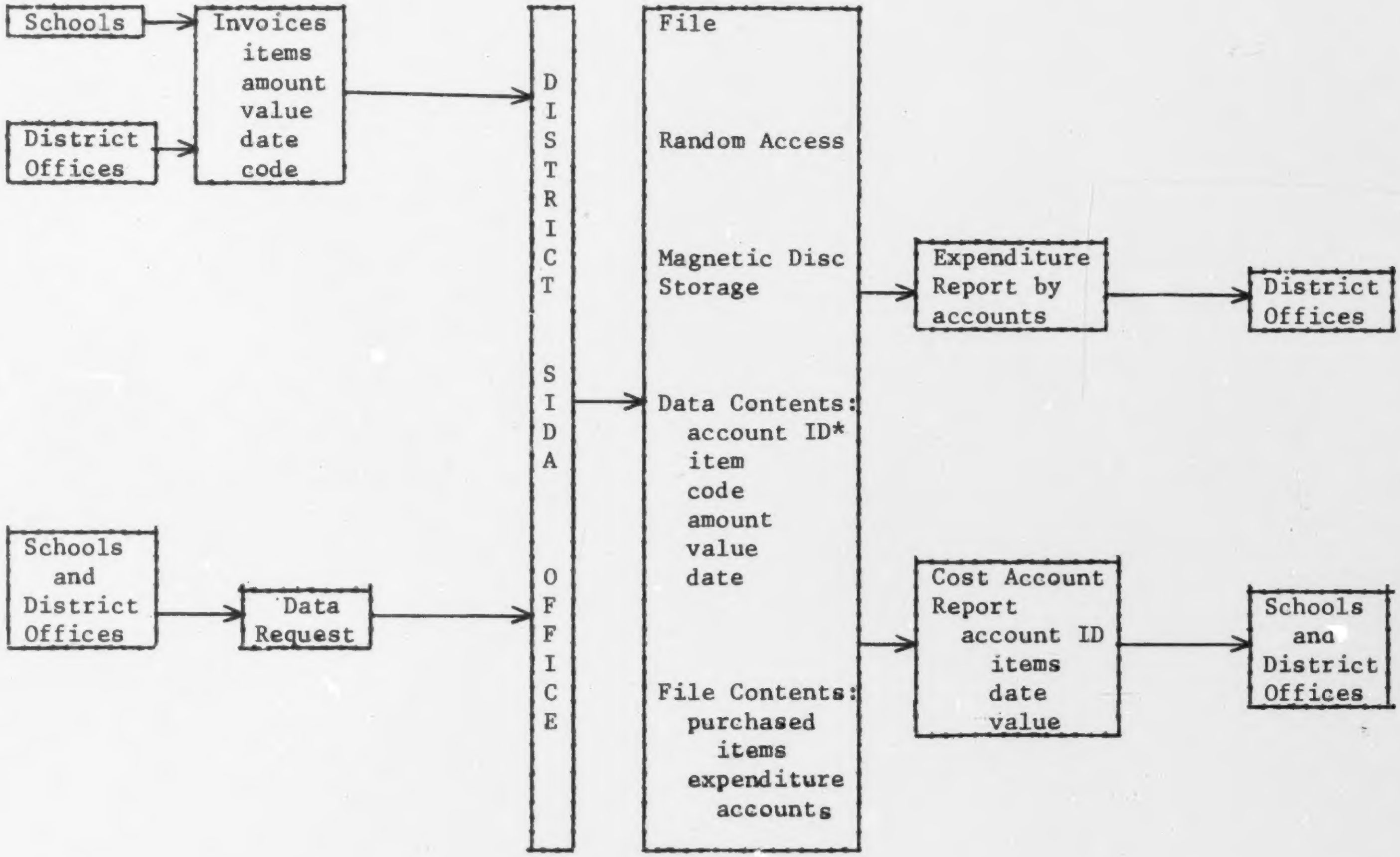
FIGURE 3.1.1.5.3

3.1.1.7 Cost Activity

This activity -- which includes all the financial and expenditures transactions at the district level -- is shown by the flow diagram in Figure 3.1.1.7.1. The file is part of the district central file. The data contents of the file are tentative, as they would be part of the financial system design for the national level.

In this activity, all costs incurred by the schools and district offices must be reported and entered into the district central file.

COSTS - DISTRICT LEVEL


Schools
District Offices
Invoices items amount value date code
Schools and District Offices
Data Request
DISTRICT SIDA OFFICE
File
Random Access
Magnetic Disc Storage
Data Contents: account ID* item code amount value date
File Contents: purchased items expenditure accounts
Expenditure Report by accounts
District Offices
Cost Account Report account ID items date value
Schools and District Offices

*ID refers to identification

FIGURE 3.1.1.7.1

3.1.1.8 Scholastic Data-Collection Activity

In this activity, all pertinent scholastic data would be collected and entered into the district central file. The corresponding flow diagram is shown in Figure 3.1.1.8.1

The "one data item" in "Data Request" and "Data Response" refers to one item of data obtained with no special program (e.g., number of 10 year old students in departmental capital), as opposed to an information report which would require a special program. The data collected during the scholastic year may be transferred to magnetic tape for permanent storage at the end of the scholastic year.

SCHOLASTIC DATA COLLECTION - DISTRICT LEVEL

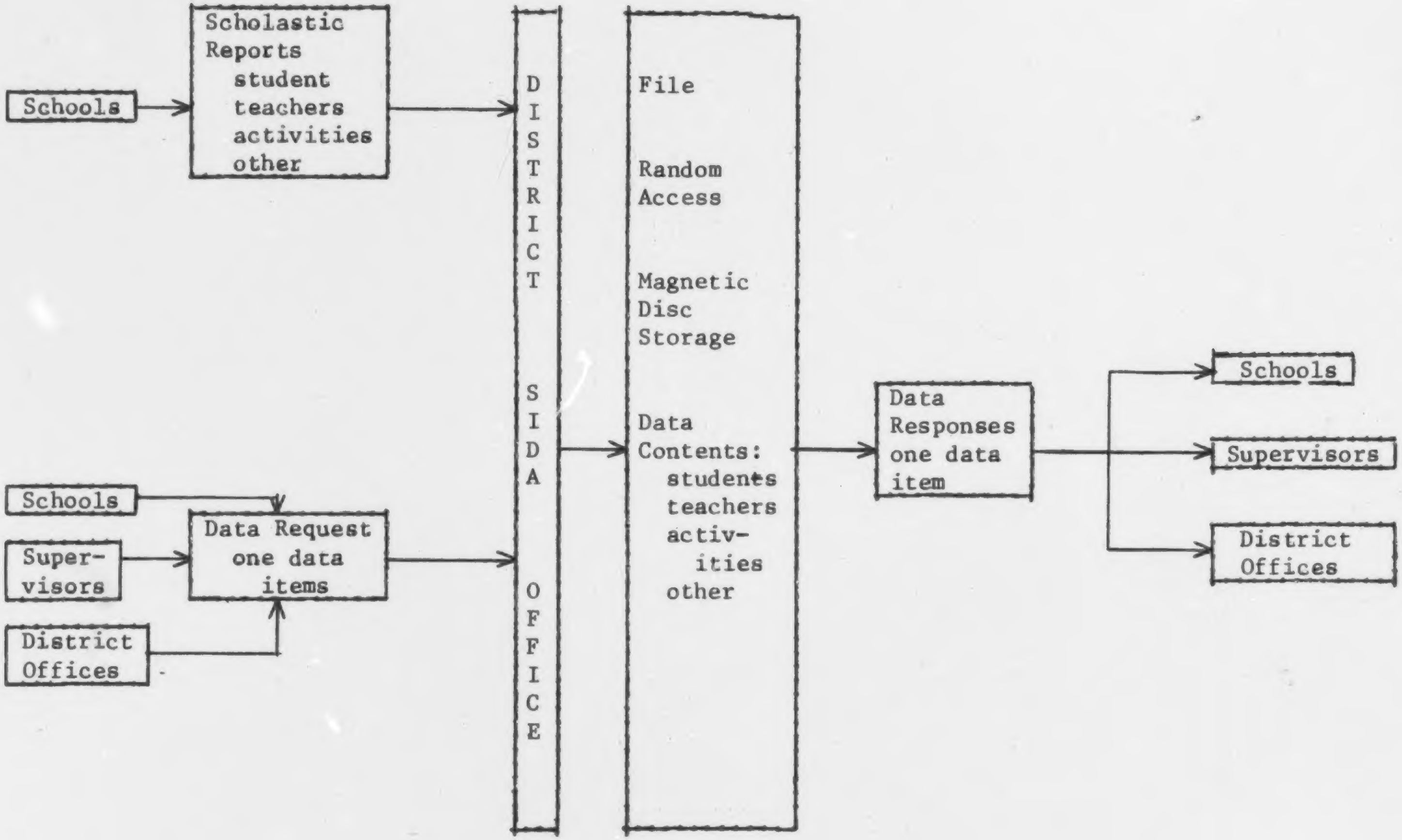

Schools
Scholastic Reports
student
teachers
activities
other
Schools
Super-visors
District Offices
Data Request
one data items
DISTRICT SIDA OFFICE
File
Random Access
Magnetic Disc Storage
Data Contents:
students
teachers
activ-ities
other
Data Responses
one data item
Schools
Supervisors
District Offices

FIGURE 3.1.1.8.1

3.1.2 Planning Information System

The principal activity of this system is providing information at the national and district levels. The respective flow diagrams are given in Figures 3.1.2.1 and 3.1.2.2.

At the national level, information reports from the manual file on inventory and distribution are provided to the Information Department, for integration into the magnetic disc file. In this way, information reports provided by the Information Department include data from all the files.

INFORMATION - NATIONAL LEVEL

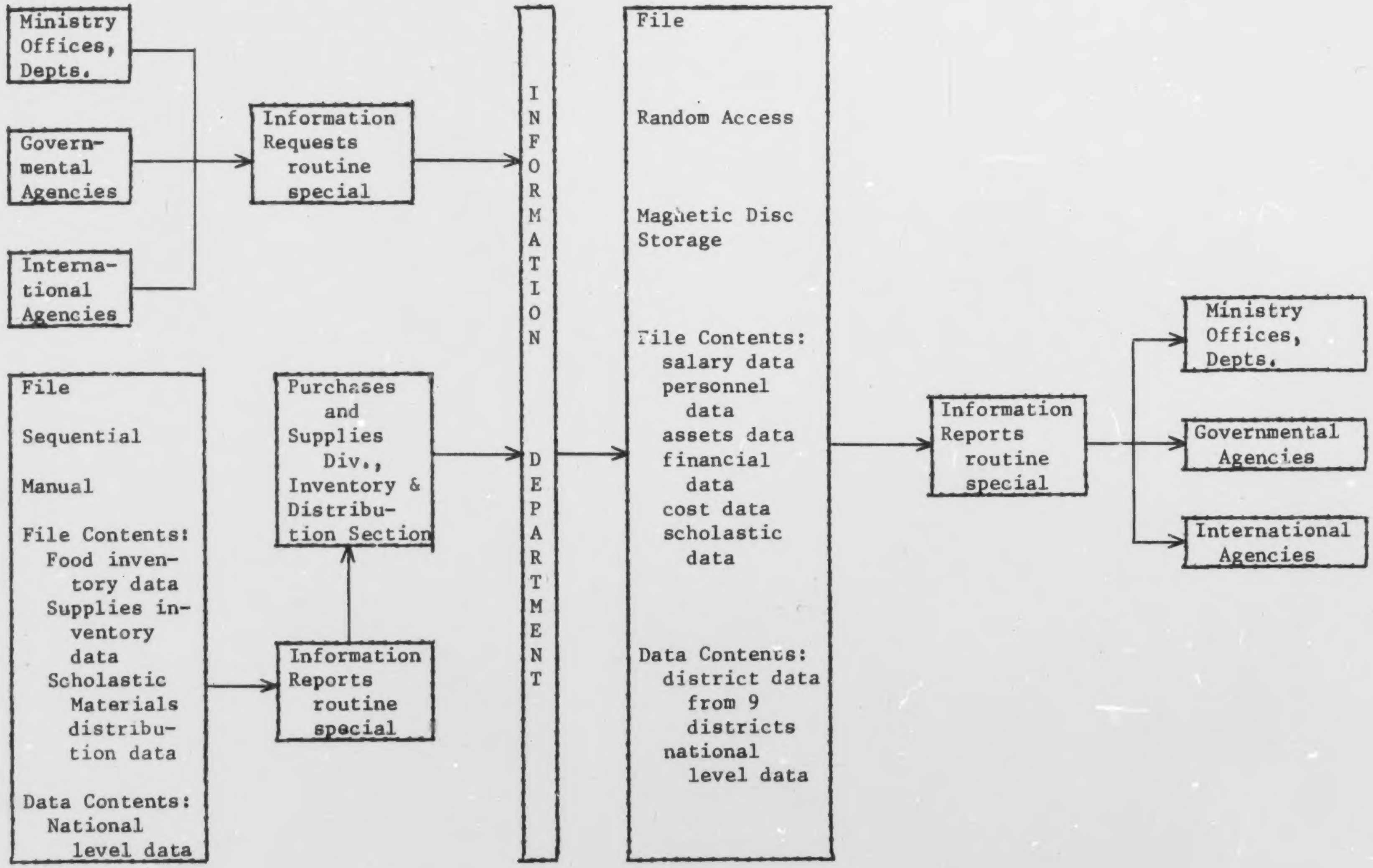

Ministry Offices, Depts.
Governmental Agencies
International Agencies
Information Requests routine special
File
Sequential
Manual
File Contents: Food inventory data Supplies inventory data Scholastic Materials distribution data
Data Contents: National level data
Purchases and Supplies Div., Inventory & Distribution Section
Information Reports routine special
INFORMATION DEPARTMENT
File
Random Access
Magnetic Disc Storage
File Contents: salary data personnel data assets data financial data cost data scholastic data
Data Contents: district data from 9 districts national level data
Information Reports routine special
Ministry Offices, Depts.
Governmental Agencies
International Agencies

FIGURE 3.1.2.1

INFORMATION - DISTRICT LEVEL

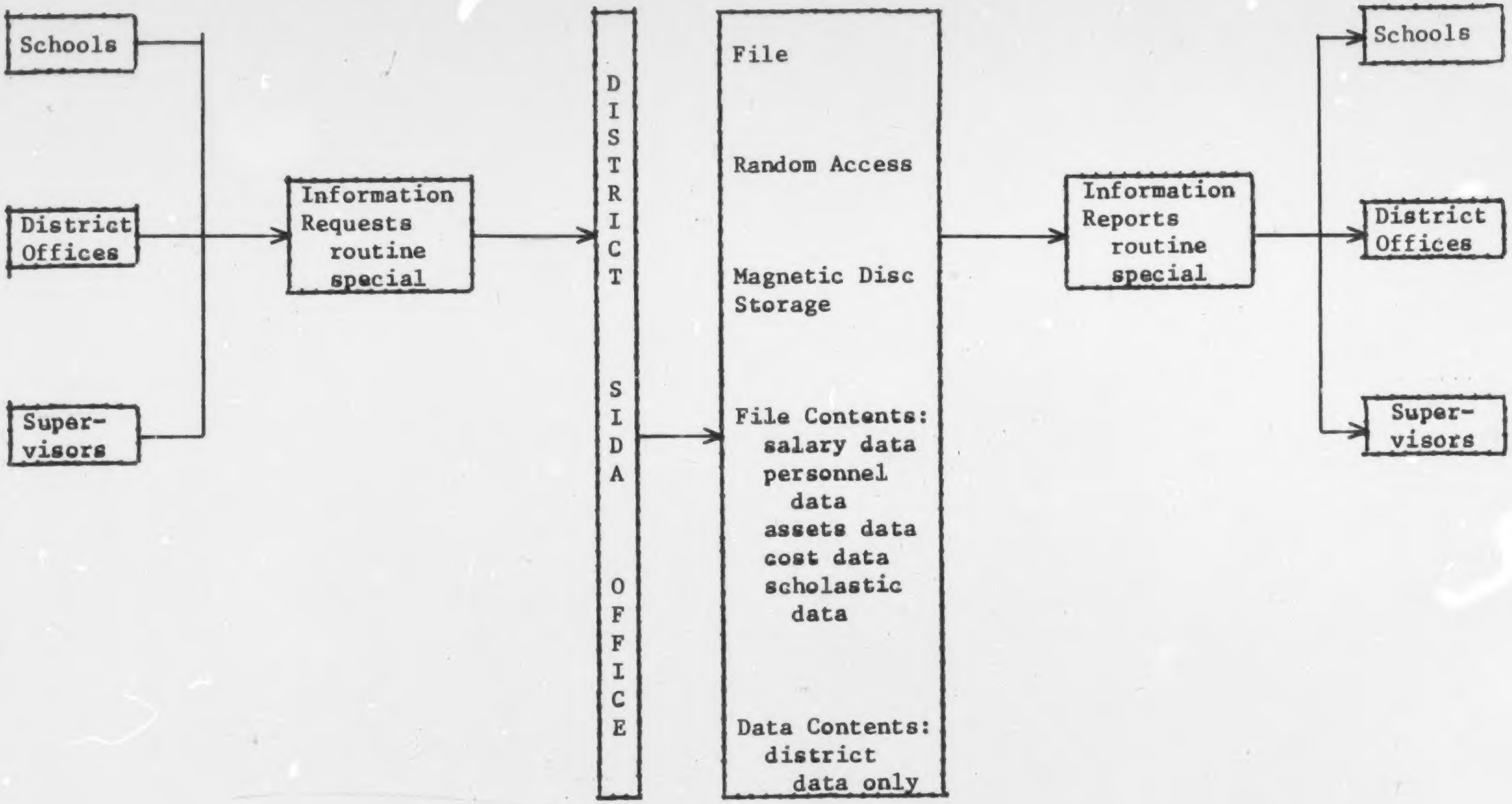

Schools
District Offices
Super-visors
Information Requests routine special
DISTRICT SIDA OFFICE
File
Random Access
Magnetic Disc Storage
File Contents: salary data personnel data assets data cost data scholastic data
Data Contents: district data only
Information Reports routine special
Schools
District Offices
Super-visors

FIGURE 3.1.2.2

3.1.3 Printing Activity

This activity functions at the national level and will provide printing facilities and services. The flow diagram is given in Figure 3.1.3.1. Its data output to the Administrative Information System will be production and equipment-utilization data.

This activity will be located in the Department of Scholastic Technical Support - SATE.

PRINTING ACTIVITY - NATIONAL LEVEL

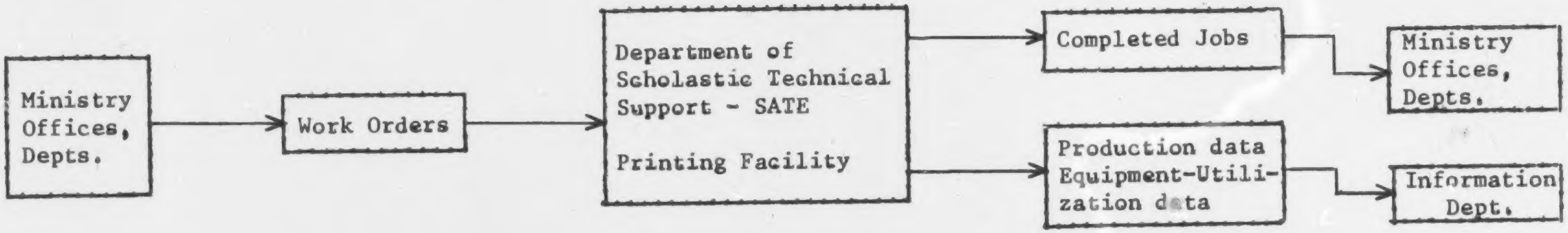

Ministry Offices, Depts.
Work Orders
Department of Scholastic Technical Support - SATE
Printing Facility
Completed Jobs
Production data Equipment-Utilization data
Ministry Offices, Depts.
Information Dept.

FIGURE 3.1.3.1

3.2 Equipment Configuration

The required equipment for the Administrative Information System and the Planning Information System is the new computer system to be acquired by CENACO (National Computing Center). The computer system will include the following features and capabilities:

- On-line operation for inquiries, data entry, and file up-dating;
- Conversational mode of operation;
- Very large random-access storage;
- Remote terminal operation;
- High level general purpose procedural languages, such as FORTRAN V and ANSICOBOL.

Operation of the Administrative Information and Planning Information Systems at the national and district levels will require the use of data terminals, to access the central files in the computer system.

3.2.1 District Level Data Terminals

The features and characteristics of the terminal at the district level are as follows:

- Alphanumeric Keyboard with at least a 96 character set;
- Printer of approximately 250 lines per minute and 132 character positions, which can provide up to 5 copies of continuous paper output;
- Buffers, modems, terminal handlers, communications line interfaces, etc.;
- Data entry code must be USASCII.

This type terminal will be required in 8 of the 9 District SIDA offices. The La Paz district SIDA office will have the same type terminal as is used at the national level.

3.2.2 National Level Data Terminals

The features and characteristics of the terminal at the national level are as follows:

- Alphanumeric Keyboard with at least a 96 character set;
- Printer with a minimum speed of 30 characters per second and a minimum of 80 character positions, which can provide a minimum of one copy of continuous paper output;
- Data entry code must be USASCII;
- Buffers, modems, terminal handlers, etc.

This type terminal will be required in the La Paz district SIDA office and in 5 Ministry offices for the activities of Salaries, Personnel, Assets, Finances and Information.

3.3 Organization, Skills, and Personnel

3.3.1 Organization

To assure the proper operation and maintenance of both the Administrative Information System and the Planning Information System, it is recommended that the Information Department have complete responsibility for both systems at the national and district levels. (Throughout this report, reference is made to an Information Department, the creation of which is necessary, if the information systems are to be implemented.) It is suggested that the existing Statistics Department (in Educational Planning) and the mentioned Information Department be one and the same, with the name of Department of Information and Statistics. It is further advised that this Department be raised organizationally within the Ministry, to a point where it can cut across organizational lines without special authority. This will further assure its effectivity in managing and operating the systems for the purposes for which they were designed. This department should include all other existing statistical activities within the Ministry. Any and all system changes, modifications, and improvements -- whatever their source and nature -- must be channeled through the Department of Information and Statistics Department before being implemented.

The following additional organizational recommendations are presented:

3.3.1.1 The Salary activity at the national level should combine the existing Urban and Rural Budget Execution Divisions into a Salary Department.

3.3.1.2 The Personnel activity at the national level should combine the existing Teacher Personnel Department (Rural and Urban) and the existing National Department of Administrative Personnel into a single Personnel Department.

3.3.1.3 The Assets activity at the national level should be handled by the existing Assets Division within the Department of Purchases, Supplies, and Assets.

3.3.1.4 The Budget Control activity at the national level should be a division within the existing Financial Department.

3.3.1.5 The Inventory and Distribution activity at the national level should be a division within the existing Department of Purchases, Supplies, and Assets.

3.3.1.6 The Salary, Personnel, Assets, Costs and Scholastic Data - Collection activities at the district level should be handled and managed by the SIDA offices in the districts.

3.3.2 Skills

Operating and maintaining the Administrative Information System and the Planning Information System require specialized skills and personnel. Through formal courses and on-the-job training, the required skills would be provided.

Some of the necessary skills are as follows:

3.3.2.1 Data-Collection

This skill would assure proper data-collection on special forms, through the utilization of pre-established and documented procedures.

3.3.2.2 Input Data-Preparation

This requires putting the data into codes and formats suitable for machine processing. The objective of this training is to assure accurate preparation and properly coded input data for processing.

3.3.2.3 Input/Output Control

This consists of receiving, recording, controlling and coordinating data terminal inputs and outputs. It includes such tasks as:

- Keeping logs of input documents received and output documents transmitted;
- Control of data-processing supplies and materials;
- Assembly of data files, input, and other material, before processing begins.

3.3.2.4 Terminal Operation

This is actual operation of the data terminal for data input, inquiries, data retrieval, file updating and other operations.

3.3.2.5 Terminal Programming

This requires use of the terminal in developing and executing programs in "batch" or conversational modes of operation.

3.3.2.6 Applications Programming

This includes preparing programs for operation, correcting errors in programs, improving operating programs, developing programs for retrieving information from the central files, etc.

3.3.2.7 Systems Analysis

This is the analysis of present systems, application programs, data, and information, in order to improve the systems by using data-processing equipment and techniques.

3.3.2.8 Supervision and Administration

Special aspects of administration and supervision of data-processing are required for the proper management of the operational information systems. Some of these are:

- Good utilization of equipment (which is a constant concern, in order to meet schedules);
- A thorough knowledge of the technical details of the information systems and the data-processing techniques used.

3.3.3 Personnel

The personnel who would be trained in the above indicated skills include the following:

3.3.3.1 Data-Collection: Teachers, supervisors, school directors, SIDA personnel, and personnel from the Ministry offices and departments.

3.3.3.2 Input Data Preparation: SIDA personnel and personnel from those Ministry departments which have data terminals.

3.3.3.3 Input/Output Control: SIDA personnel and personnel from those Ministry departments which have data terminals.

3.3.3.4 Terminal Operation: SIDA personnel and personnel from those Ministry departments which have data terminals.

3.3.3.5 Terminal Programming: SIDA personnel and some personnel from those Ministry departments which have data terminals.

3.3.3.6 Applications Programming: Some SIDA personnel and personnel from the Department of Information and Statistics.

3.3.3.7 Systems Analysis: Some personnel from the Department of Information and Statistics.

3.3.3.8 Supervision and Administration: Two persons from the Department of Information and Statistics.

4.0 ADDITIONAL COMMENTS: THE NEW COMMUNICATION CHAIN

In parts I and II of this report, this section (i.e., "Additional Comments") has followed a format based on the levels of communication within the administrative sector of the educational system -- first in describing the existing communications system, then in listing the requirements for improving that system. In elaborating the design specifications for a new system -- as this Part III does -- however, such a format is not feasible. Rather, we shall list and elaborate the major aspects (or, in fact, sub-systems) which were implied in the suggestions for change (i.e., requirements for improving the system) given in Part II. Obviously, these aspects cut across the levels of communication within the system; they include:

1. Centralized office space, on the national and district levels (including an internal and external telephone system);
2. Regular staff meetings;
3. Office management practices;
4. Communication with extra-ministerial persons and agencies;
5. Correspondence control system;
6. Radio communications system;
7. Transportation system, on the district, zonal, and local levels;
8. National and/or district-level conferences/congresses;
9. Newsletter for educators and administrators;
10. Miscellaneous suggestions.

4.1 Centralized Office Space, on the National and District Levels

This report does not presume the ability to suggest all the specifications necessary for the planning of a central ministerial building on the national level. Such a design would require a background study and needs analysis which were far beyond the resources of those who conducted the communications study.

Nevertheless, the need for such a structure is unquestionable; the present lack of it probably constitutes the chief communications problem now existing at the national level. Fortunately, the construction of such a central building is included in the terms of the loan/grant agreement between the Ministry of Education and Culture and USAID/Bolivia. Thus, the coming years should bring a resolution to the problem.

Planning for the structure must include the background study and needs analysis alluded to above, and the final design must indeed reflect the needs for personnel, equipment, space, storage, communications, etc., implied in plans for the administrative reform. Office arrangement should be based on the flow of communication, the frequency of need for contact, and the control of public access. An internal/external telephone system is essential; the number of extensions and/or outside lines of any given office/department should, again, be based upon the frequency of its needs for contact.

The Ministry's agreement with USAID/B also encompasses the construction of a District Center for Educational Development in each district capital. The edifice will house both the rural and urban district directorates, as well as unified district offices for administrative and pedagogical services, training facilities, etc. Such physical unity should go far in reducing the friction and lack of communications presently existing between the rural and urban directorates in most districts, and it will doubtlessly enhance their communications with the Ministry. Moreover, the joint administrative office (SIDA) -- in addition to improving the administrative services available to both directorates -- will play a critical role in the future Radio Communications System (outlined later); it will provide the communications link between the Ministry and the district, and between the district and its zones. Finally, the automotive service/maintenance facilities located in each District Center will assure the well-being and smooth functioning of the vehicles in the district's Transportation System (also dealt with later in this section).

Plans for these District Centers for Educational Development have already been tentatively formulated, and construction will begin during the coming months. Their construction in all districts of the country is -- just as the establishment of SIDA offices -- fundamental to the implementation of the overall communications system. Just as the eventual plans for the central ministerial building must be, current structural plans for the District Centers are functionally determined; i.e., they are based upon the services to be provided, the functions to be performed.

4.2 Regular Staff Meetings

With very few exceptions, the institutionalized, regular staff meeting is non-existent in the Bolivian educational system, at any level. Additionally, very seldom are fixed, specific agendas prepared prior to those meetings which are held. The effect of this is, on the one hand, that information and direction are solicited, given, and received on an individual, direct, one-to-one basis, causing incredible duplication and waste of time; and, on the other hand, that the meetings which do take place are poorly directed and controlled -- again leading to considerable waste of time.

Every chief of an administrative unit within the Ministry and every district director should establish a schedule of regular, fixed staff meetings with the personnel under his supervision. The frequency of such meetings would depend entirely upon the director's perception of recurring need for regular contact and transmission of direction/information; the meetings could be daily, weekly, monthly, quarterly; they could last for five minutes or five hours, depending on need. Every administrative chief has an idea of the nature and necessary degree of contact/communication with his staff; based upon this and the wishes of his subordinates, he should regularize and formalize this contact/communication.

Moreover, the chief must be responsible for preparing an agenda prior to the meeting. He should establish a pre-meeting deadline for acceptance of agenda items from his staff, and only in exceptional instances should he accept any divergence from the agenda during the meeting. Concomitantly, he must exercise direction and control of the meeting, sticking to the business at hand and keeping extraneous conversation to a minimum.

It is erroneous to assume that such regular meetings would necessarily constitute an added drain on time. If they are properly planned and managed, they are a time-saving device, infinitely preferable to the current de facto system of informal, individual, duplicative contact/communication. Moreover, they enhance the proper flow of information, and they assure that business is attended to in a timely, efficient manner.

The institutionalization of regular staff meetings in no way precludes specially called meetings or individual contact between a chief and a subordinate. But it keeps these to a minimum, with a resulting saving of time for all parties.

4.3 Office Management Practices

It is not the purpose of this section to deal with all the problems/examples of office management. Rather, we are concerned only with those which have a direct bearing on communication.

Anyone who has tried to communicate with a ministerial official during regular office hours is well aware of what a frustrating, trying experience this can be. He seldom arrives on time; he usually leaves early; and he is most often out of his office between times, hardly ever leaving word as to where he can be reached or when he will return. Thus, he is an extremely difficult person to contact, and one wonders when he has time to do his work.

Obviously, top officials of the Ministry cannot be expected to spend all their time in their offices. They have tasks to perform and contacts to make outside the Ministry, meetings to attend, etc. However, they could alleviate the problems caused by their absences and set a much-needed example for their subordinates by observing a few set rules/practices.

Unless he is attending to official business outside the office, an office chief should abide strictly by office hours, and he should require every member of his staff to do so. Neither he nor any member of his staff should leave the office without good cause; most importantly, when leaving the office, he (or any staff member) should leave word with the secretary as to where he is going, where he can be contacted (ergo, telephone number), and when he expects to return; should he not be able to return at the expected time, he should call his office to update the information.

The objective of the above is not the introduction of regimentation; rather, it is the introduction of communicability and efficiency. It will expedite communication, aid in office operations, and save time and effort.

The opposite side of the coin -- and a very obvious, negative aspect of office management -- is, ironically, excessive communicability: Open access to offices. The result is virtually the same: Operational inefficiency, wasted time and effort, inadequate time to perform one's regular duties. The image of crowds milling around offices, uncontrolled, competing for the time of harried officials, is all too typical of the Ministry of Education and Culture. It could be terminated in short order by the simple expedient of regularity in receiving the public. If each official (or, the Ministry as a whole) would establish set days and hours of the day for meeting the public, require that each person seeking an interview make an appointment with the secretary, and strictly abide by these procedures (literally keeping the doors locked during the "non-public" days and hours), then the problem would solve itself. (Obviously such a practice would require office arrangements which end open access to an official's office, forcing the public to pass by the secretary, in order to gain access; thus, the problem cannot be totally solved until the Ministry has a new building which facilitates such arrangements.)

Again, the objective of the foregoing is not regimentation. It is designed to save the time of the individual official and to create a more suitable office atmosphere in which he can work more peacefully and efficiently. Additionally, it saves the time and effort of the person who is seeking an interview. Finally, it would tend to improve communications between Ministry officials and the public.

4.4 Communication with Extra-ministerial Persons and Agencies

Again, limitations on time and other resources precluded the in-depth study which is necessary, if a definitive statement on suggestions and specifications is to be formulated. However, the problems existing in this area were ascertained, and the need for change was established.

Many top-level functionaries in the Ministry spend 50% of their work hours in formal or informal contact outside the Ministry of Education -- with persons, agencies, or representatives of other ministries. There is no denying the necessity of such contact; it is often essential to the fulfillment of official responsibilities within the Ministry of Education. However, unnecessary contact must be kept to a minimum, and necessary contact must be formalized and regularized, fixed and limited. The results of such an effort would be two-fold: Needed contact/communication would be facilitated and assured; time would be saved, again allowing the functionary to devote more work hours to his responsibilities within the Ministry. (Probably, this would not be possible in some offices -- *ergo*, International Relations, Information and Public Relations -- where the nature of duties requires frequent, extemporaneous outside contacts; however, it *is* possible and feasible in most of the Ministry's offices.)

Similarly, outside contacts are numerous and necessary on the district and school/nucleo level -- with "padres de familia", religious groups, and other community organizations whose aid and cooperation are essential to the well-being of the educational system. (In reality, such contacts are just as important at these levels as at the national one.) Again -- and for the same reasons -- these contacts need to be formalized and regularized, to the greatest degree possible.

Thus, if indeed a definitive statement of suggestions and specifications is to be elaborated for this area, the in-depth study referred to above must be conducted. It could be performed by a qualified person already working in the Ministry of Education, using ministerial facilities, secretarial help, etc.; this would keep costs to a minimum. The study could be conducted by one person in four months (17 weeks), allowing nine weeks for travel to the districts, four weeks for the Ministry, and four weeks for completion of the final report/manual, giving guidelines and specifications. Necessary costs would be:

Materials:	$ 100
Per diem:	$1,071
(1 Technician, x 9 districts, x 7 days/dist. x $17/day =$1,071)	
Travel: (To and from district, and within dist.)	$ 900
(1 Technician x 9 districts x $100/dist.=$900)	
Publication: (Typing, printing, distribution, miscellaneous costs)	$ 300
Total Costs for Conducting the Study:	$2,371

It would then be the responsibility of the Ministry (probably, the direct responsibility of the Direction of Administration) to assure that the report/manual is given proper distribution, and that its recommendations are put into practice. In the meantime, improvement can only come through individual effort. Each functionary must do all in his power to regularize and limit his outside contacts, and to save as much time as possible for his office duties.

4.5 Correspondence Control System:

In April, 1973, a basic working paper was drafted to provide guidance to those who manage the Correspondence Control System within the Ministry of Education and Culture. It appears in Quarterly Report No. 6 (June, 1973) of the Technical Assistance Project of the San Jose (California) State University Foundation, Inc.; that report is available for reference, and it shall not be repeated here.

Despite the working paper, the System has not functioned properly, and it has not provided adequate service to the ministerial offices which depend upon it.

A thorough study of the Correspondence Control System is presently being conducted by a technician of the San Jose Mission. The report resulting from that study will be provided to the Direction of Administration and the Consejo de Racionalizacion Administrativa, so that the findings of the study can be implemented. Certainly, one of the fundamental problems of the System (and a basic, inhibiting factor in its functioning) has been and is the lack of space, facilities, and qualified personnel. The amelioration of this situation will doubtlessly involve the expenditure of funds. However, at this point, exact specifications and amounts cannot be given; this must await the completion of the study.

When completed, copies of the suggestions provided by the study will be distributed to the district directorates, so that they -- when applicable and feasible -- can be put to use on that level also.

Generally, the foregoing portions of this section have dealt with changes in behaviour and practice, rather than with systemic changes which will require major investments in money, material, and personnel (with the obvious exception of central office buildings). Such will not be true of many of the following portions; they will be expensive, and they will demand a relatively large share of resources. But they are essential to a communications infrastructure, and the benefits which they will provide to the Bolivian educational system -- in both administrative and pedagogical services -- more than justify the investment. (Moreover, it should be noted that these aspects have been included for financing under the soon-to-be-implemented loan/grant agreement between USAID/Bolivia and the Ministry of Education and Culture.)

4.6 Radio Communications System

It should be reiterated that a two-way radio system will not necessarily replace written communication. In some instances, of course, it will -- depending on the nature of the message. Most often, however, it will serve as a means of alerting the receiving party (ergo, when urgent action is necessary), prior to dispatch of the corresponding written communication.

In designing the radio communications system, certain factors/ difficulties were given primary consideration, including: Cost (both the original purchase price and maintenance and operation expenses); simplicity of equipment operation (thus precluding the requirement for specialized personnel); durability and suitability of equipment ; equipment power and transmission/reception range; prevention of personal use/ abuse of the equipment; the problem of obtaining a license for operating a large number of frequencies (and, thus, the need to keep number of frequencies to a minimum); the logistics involved in equipment repair/maintenance; the problem of a competent supplier, who could supply and install the equipment, and later provide the required maintenance services.

The design is based (particularly in its equipment and cost specifications) on information supplied by La Paz offices of Telco, Ltda. and Hansa, Ltda., in accordance with the needs specifications which we supplied to them. These specifications are offered merely to give the reader an idea of what the radio system would entail. We are not suggesting that any particular equipment be used in implementing the system. Wisely, funds have been included in the loan/grant which USAID/Bolivia is making to the Ministry of Education and Culture, which will allow a thorough feasibility study upon which to base the radio communications system; this study will provide the final equipment specifications.

4.6.1 The Design

The operation of the system would be by SSB (single side band) Simplex telephone, using 300 watt transmitters/receivers. The distribution of equipment would be in the following manner:

National Level: One single-channel transmitter/receiver (SSB Simplex telephone, 300 watts), using frequency "A", communicating with the district capitals.

District Level: In each district capital*, one single-channel transmitter/receiver (SSB Simplex telephone, 300 watts), using frequency "A", communicating with the Ministry; and one single-channel transmitter/ receiver (SSB Simplex telephone, 300 watts), using frequency "B", "C", "D", "E", "F", "G", "H", "I", "J" (i.e., one separate frequency for each district -- nine in all), for communicating with the zones. (Note: It is cheaper and -- for other considerations -- more feasible to have two single-channel sets in each district, then to have one multi-channel set capable of communicating with both La Paz and the zones.)

Zonal Level: In the office of each zonal supervisor, one single-channel transmitter/receiver (SSB Simplex telephone, 300 watts), using frequency "B", "C", "D", "E", "F", "G", "H", "I", "J" (i.e., the frequency corresponding with its district capital), for communicating with the district capital.

Thus, the network includes 10 frequencies; the Ministry can communicate with the district capitals (simultaneously or individually), each district capital can communicate with the Ministry and with its zones (simultaneously or individually), and each zone can communicate with its district capital.

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*For obvious reasons, the district of La Paz does not need a radio set for communicating with the Ministry; thus, it would have only one set, for communicating with its zones.

On the national level, the radio set should be located, ideally, in the Information Office (the establishment of which was suggested earlier in this report), or, alternatively, in the Direction of Administration; this office would maintain control over use of the set and all incoming/outgoing messages (including a filing and distribution system); it must define regulations for use of the system, including guidelines on the nature and length of messages which may be sent via radio. On the district level, the radio set would be located in, and under the control of the SIDA Office; SIDA'S responsibility would be essentially the same as that of the controlling office at the national level. In the zones, the radio sets would be located in the offices of the zonal supervisors.

Thus, several implications are immediately obvious. The radio system cannot be implemented until SIDA offices are established. (To locate the radio set in either the Urban or Rural Directorate of a given district would be a grievous insult to the Directorate which was slighted.) Thus, initial implementation should take place in the four districts which have SIDA's; it could later be extended to additional districts, as they acquire SIDA Offices. Further, the system cannot be implemented on the zonal level until Zonal Supervisory Offices are established. The form, functions, and distribution of these offices should be determined immediately, so that they can be established on a priority basis (because of the technico-pedagogical need for them, as well as because of their importance in the communications chain). Meanwhile, the radio system can be established down to the district level. Finally, set schedules must be elaborated for use of the radio system, with pre-established times set aside for communication between any two given points. For example, it could work as follows:

Between Ministry and Districts (Excluding the La Paz District)

08:30 - 09:30 - Ministry transmits to all districts.

09:30 - 17:30 - (Including the lunch hour) One hour allotted to each individual district for communication with the Ministry.

17:30 - 18:30 - Ministry transmits to all districts, or time is left open for emergency communications.

Between a District and its Zones

The district does not communicate with its zones during the hours 08:30 - 09:30, 17:30 - 18:30, and the particular hour set aside for its communication with La Paz. Thus, six hours per day remain for district-zone communication. Of this, perhaps one hour can be dedicated to the district's transmitting to all of its zones, and 30 to 45 minutes for inter-communication with each individual zone (assuming eight to twelve zones in a given district). (It should be noted that this system allows a single radio operator to handle both of the district's radio sets.)

It goes without saying that -- once the system is in operation -- schedules should be modified in accordance with actual usage patterns.

4.6.2 System Specifications

4.6.2.1 Equipment

127 units	-	Radio transmitter/receiver set, (SSB Simplex telephone operation, 300 watts, 110/220 volts, 50/60 cycles), complete with microphone and crystal. (The number of units includes 1 for the Ministry, 17 for the districts, 100 for the zones, and 9 reserve units.)
118 units	-	Antenna, appropriate for use with radio set.(The number of units does not include anntennas for the reserve sets; they are obviously not needed, because the antennas are permanently installed.)
18 units	-	Telephone patch, appropriate for use with radio set. (The number of units includes 1 for the Ministry and 17 for the districts.)
4 units	-	Teletype machine, with adaptor and teleprinter, appropriate for use with radio set.(The number of units includes 1 for the Ministry, 1 each for Cochabamba and Santa Cruz -- where, it is anticipated, communications traffic will be the heaviest -- and 1 reserve unit.)
109 units	-	Electrogenerator, 0.65 KVA; with 3 HP motor. (The number of units includes 1 for each zone, to supply electrical energy to the radio sets, and 1 reserve unit per district. It is assumed that there will be no other source of electrical energy in the zones, during office hours.)

Reserve units of the radio sets, teletype machine, and generators/motors are included, precisely to assure smooth operation of the system and a minimum loss of time and contact through equipment failures. There is virtually total interchangeability among the radio sets and generators/motors. Thus, one reserve unit of each of these items in each district would suffice. It could be sent to any zone within the district to replace a broken unit (or, clearly, it could replace a broken unit used by the district); the broken unit could be sent to La Paz for repair (a radio set), or it could perhaps be repaired in the district capital (a generator/motor); following repair, the unit would be sent back to the district and would become the reserve unit. The reserve teletype machine would be kept in the Ministry.

4.6.2.2 Costs (All costs are approximations)

Radio sets - 127 units at US$600 per unit	US$ 76,200
Antennas - 118 units at US$70 per unit	US$ 8,260
Telephone patches - 18 units at US$60 per unit	US$ 1,080
Teletype machines (including adaptor and teleprinter) 4 units at US$2,000	US$ 8,000
Shipping, handling, legal fees, insurance, etc., approximately	US$ 1,500
Total costs for radio equipment, in the Aduana, La Paz	US$ 95,040
Delivery of each individual radio set to its locale, installation, checking of the system, etc. 118 units at average US$150 per unit (does not include reserve units)	US$ 17,700
Generator/motors - 109 units at approx. US$275 (Aduana, La Paz)	US$ 29,975
Delivery of each individual generator/motor to its locale, installation, checking, etc. 100 units at approx. US$50 per unit (does not include reserve units)	US$ 5,000
Total costs for all equipment, delivery, installation, etc.	US$147,715
Plus 20%, to allow for errors in quoted prices, mistakes in cost estimations, price increases prior to purchase, etc.	US$ 29,543
TOTAL EQUIPMENT-RELATED COSTS:	US$177,258

To these costs one must add the expenses of a feasibility study (referred to earlier) and those of an evaluation (to take place after the system has been functioning for several months). The feasibility study, particularly, must be thorough , and it must be performed by competent, totally objective, disinterested persons. It is suggested that assistance be contracted locally (i.e., in Bolivia) for the study; thus, a typical budget (calculating four months -- 17 weeks -- for the study) would be:

Salaries:		US$13,600
1 Technician (Director) at $10/hr. x 40 hrs./ wk. x 17 wks.=	$ 6,800	
2 Technicians at $5/hr. each, x 40 hrs./wk. x 17 weeks=	$ 6,800	
	$13,600	
Administrative Services (office, materials, secretary, draftsman, etc.) $6/hr. x 40 hrs/wk. x 17 wks =	$ 4,080	$4,080
Per Diem:		
1 Technician x 4 districts, x 14 days/district x $17/day =	$ 952	
1 Technician x 5 districts, x 14 days/district x $17/day=	$ 1,190	
	$ 2,142	$2,142
Travel: (Travel to and from the district, and within the district) 9 districts, x $150/ district (average) =	$ 1,350	$1,350
Foreign Assistance:		$3,380
Salary: 1 Expert x $150/day x 15 days =	$ 2.250	
Per diem: 15 days at $22/day =	$ 330	
Transportation: Round trip, USA-La Paz, $800 =	$ 800	
	$ 3,380	
Publication: (printing, distribution, miscellaneous costs)		$ 450
TOTAL COSTS FOR CONDUCTING THE FEASIBILITY STUDY:		$25,002

If somewhat less critical than the feasibility study, the evaluation is nevertheless important and must be performed. It can be conducted by one person (someone already employed by the Ministry, and using ministerial facilities); thus, the costs involved are strictly operational ones. The system should be functioning for at least six months before the evaluation is performed. An operating budget would be as follows (allowing 3 months for the study).

Salaries and Administrative Services:	$ 0
Existing ministerial personnel (technician and secretary) and facilities to be used; no added costs involved.	
Materials:	$ 100
Per diem:	
1 Technician x 9 districts x 7 days/dist., x $17/day = $1,071	$1,071
Travel: (Travel to and from the district, and within the district) 9 districts x $100/district (average) = $ 900	$ 900
Publication: (Printing, distribution, misc. costs)	$ 300
TOTAL COSTS FOR PERFORMING THE EVALUATION:	$2,371

Thus, the overall costs of the system include:

Equipment-related costs	US$177,258
Feasibility study	US$ 25,002
Evaluation of the system	US$ 2,371
TOTAL COSTS FOR ESTABLISHING A RADIO COMMUNICATIONS SYSTEM:	US$204,631

Some clarifications to the above are necessary. All prices are quoted without import duties (it would be the Ministry's responsibility to secure "liberación"); prices of the radio sets and generators/motors are based on the purchase of at least 100 units. Clearly, all prices are subject to change (although the 20% added factor attempts to allow for this).

Various difficulties will be encountered and should be expected. Not the least of these is the ability of local suppliers to produce what they promise, within the time periods specified. It was extremely difficult to even secure information and cost estimates from them; actual implementation of the system should prove even more trying. The major problem will doubtlessly be in obtaining radio licenses and operating frequencies;the very formidable opposition of ENTEL can be anticipated, and the Ministry should be prepared for the battle ahead. Failure in this area, of course, precludes implementation of the system.

4.6.2.3 Space

Space considerations are important, but not critical. The radio set and its operator will take no more space than a secretary sitting at a small desk; the inclusion of the generator/motor will add no more than 50% to the required area. Thus, a small office should suffice, and no additional office space -- with the possible exception of the national level -- will be required. Nor does the equipment necessarily require a special environment -- ergo, air conditioning. However, the radio operator will require relative freedom from distraction; thus, he should not be located near an office/ area where noise or human traffic will disturb him, or where the radio communications will bother those around him. Finally, one must be able to lock the operator's office securely, to keep the danger of theft to a minimum.

4.6.2.4 Personnel

A full-time radio operator will be needed in the Ministry and in each SIDA Office. (And, here, full-time means precisely that: from 08:30 to 18:30, including the lunch hour, every workday.) Thus, unless present employees can be assigned to this task, new "items" will have to be created, and new personnel hired. However, the position requires no special skills, and no real repair/maintenance work will be required of the operator (with the exception of minor preventive maintenance). Additionally, he will be provided with operation and maintenance manuals for the equipment (included in the purchase price) by the supplier.

4.6.2.5 Training

Since all repair work and major maintenance will be conducted by the equipment supplier or other specialized persons, the radio operator will not need specialized training in these areas. Training will be necessary in equipment operation and basic preventive maintenance; such training will be given by the supplier's representative to each individual operator, at the time of installation of the equipment. (This service is also included in the purchase price of the equipment.)

4.7 Transportation System, on the District, Zonal, and Local Levels

It has been pointed out that transportation difficulties at the district and sub-district levels constitute a problem which not only weakens the communication chain, but also -- and perhaps more importantly -- inhibits the supervisor and the nucleo director in the performance of their technico-pedagogical and administrative duties. Not only does this problem make travel more difficult and time-consuming; its major practical effect is a decrease in the number of necessary trips/visits by supervisors and nucleo directors. Additionally, and obviously, the district director needs transportation facilities.

The following design makes several assumptions which might well be questioned. Thus, the first step in bringing an independent transportation system into being should be a feasibility study which would determine -- on a district-by-district basis -- specific vehicle requirements; particular specifications and types of vehicles; the number of particular kinds of vehicles needed; the repair and maintenance needs, and the availability of facilities; the most suitable brands and quantities of vehicles, etc. Only in this manner can final specifications and costs be determined. Therefore, this design shall serve only as a guideline, a "way-station", in the development of the system. We feel, however, that the basic framework and elements which it presents are sound, that it illustrates what is necessary to make the communications system -- and the educational system in general -- function in a near-optimal manner.

4.7.1 The Design

The basic elements of the system are simple and straightforward: Four-wheel drive vehicles on the district level, motorcycles and/or motorboats on the zonal supervisory level, bicycles on the nuclec level; adequate budgetary resources and maintenance facilities for these vehicles; adequate per diem and reimbursement for travel expenses to those persons who travel in an official capacity.

Vis-à-vis perdiem and travel expenses, we could not and would not presume to suggest exact amounts or methods. Here, the point can only be repeated -- again and again -- that such payment must be institutionalized; it is basic, if we are to assure that necessary travel is performed, and such travel is fundamental to the well-being of the educational system.

There is even less need to justify the absolute necessity of budgetary resources and maintenance facilities for the vehicles within the system. To even consider purchasing such vehicles without adequate financial resources and facilities for maintaining them would be ludicrous; to actually do so would be highly wasteful and counterproductive. Part of the ministerial burden in this area will be relieved by a plan -- elaborated below -- for individual purchase and ownership of some of the vehicles. All vehicle repair and maintenance will be provided by the service facilities included in the District Centers for Educational Development; these facilities will also be under the direction of the SIDA Offices. Thus, implementation of the proposed transportation system is contingent upon the establishment of SIDA Offices and the construction of the District Centers; when this is completed in the four priority districts, implementation can begin; but it would be unwise to begin it before that time. As SIDA and the District Centers come into being in the other districts, the transportation system can be implemented there. Thus, it will be the responsibility of each district SIDA to guarantee that its budget includes sufficient funds for the operation of the district's vehicles and for the maintenance of the District Center's service facilities.

4.7.2 System Specifications

4.7.2.1 Equipment

(The following suggestions do not always necessarily imply new or additional equipment; ergo, if a given district directorate already has the number of vehicles recommended for it, there is not a need to add to that number.)

54 units -	Four-wheel drive, low-range vehicles, of the Jeep/ Land Rover/ Toyota variety. (The number of units includes 1 for the use of each district director, urban and rural -- thus, 18-- and 2 for the use of the supervisors within each district directorate, urban and rural -- thus, 36.)
100 units -	Motorcycles, of an extremely sturdy construction, with "off the road" capacity, and capable of carrying a small box (4-5 cubic feet) for equipment or printed materials; or small boats, with outboard motors, suitable for use in the Beni and Pando. (The number of units includes 1 for each of 100 zonal supervisors.)
500 units -	Bicycles, preferably with gears and heavy-duty tires, for use in rough terrain. (The number of units includes 1 for each of approximately 500 nucleo directors.)

It seems advisable that the four-wheel drive vehicles be purchased by and remain the property of the Ministry of Education. However, for the other vehicles -- motorcycles, motorboats, bicycles -- individual purchase and ownership appears preferable. Since the supervisor/nucleo director is doubtlessly going to use the vehicle for personal purposes (there is no way to prevent this), it is better to allow him to own the vehicle, and thus pay the normal operating expenses for its use and upkeep; he can therefore better fulfill his professional responsibilities, and the financial burden to the Ministry is minimal.

For the individual purchase/ownership plan to be feasible, however, much initiative and cooperation will be required by the Ministry. The Ministry must obtain the waiver of import duties on the vehicles; otherwise, no one will be able to afford them. Then, it must initially pay the cost of the vehicles and design a reasonable individual repayment plan for the supervisors/nucleo directors. Approximately US$110,000 would be adequate, assuming US$600 for motorcycles/motorboats, and US$100 for bicycles. Repayment could be as follows: Supervisor X, who purchases a motorcycle/motorboat (US$600), could pay it off in five years at 5% interest (this should be kept as low as possible), thus paying a total of US$750 in 60 months -- or US$12.50 ($b250) per month; Nucleo Director Y, who purchases a bicyble (US$100), could pay it off in two years at 5% interest, thus paying a total of US$ 110 in 24 months -- or US$4.58 ($b 91.60) per month. The money would, of course, be deducted from the monthly salary of the individual. (Clearly, the Ministry does not lose money on the proposition; rather, the money is constantly being repaid, with interest, and it constitutes a revolving loan fund which will allow future supervisors/nucleo directors to purchase vehicles.)

The Ministry should provide major repair and maintenance services for the motorcycles/motorboats through its service facilities in the District Centers for Educational Development. This could serve as partial payment for the individual's use of his private vehicle for official travel. Moreover, there is the purely pragmatic consideration: Other service facilities may be inadequate or non-existant.

Finally, the Ministry must devise a plan to govern re-sale of the vehicle and to define ownership, in case the individual leaves the educational system. For example, the individual might be prohibited from selling the vehicle for a 10 year period after purchase, unless he paid a reduced form of the original customs duties. The same payment of duties might be required of him, if he left the educational service prior to the end of a specified time period.

4.7.2.2 Costs

Four-wheel drive vehicles - 54 units at approx. US$6000 per unit	US$324,000
Motorcycles/motorboats - 100 units at approx. US$600 per unit	US$ 60,000
Bicycles - 500 units at approx. US$100 per unit	US$ 50,000
Local Delivery and Installation of 54 vehicles at $150 each (est.)	US$ 8,100
Local Delivery and Installation of 100 motorcycles/boats at $60 each	US$ 6,000
Local Delivery and Installation of 500 bicycles at $10 each	US$ 5,000
Total:	US$453,100
Plus 20%, to allow for errors in cost estimations, price increases prior to purchase, etc.	US$ 90,620
TOTAL VEHICLE-RELATED COSTS:	US$543,720

(Again, vehicle costs were calculated on the basis of duty-free import prices.)

Once again, a feasibility study is critical; qualified Bolivian personnel should be contracted to perform it. The scope of the required study is not so great as that of the feasibility study for the Radio Communications System; thus, it will require less time and personnel, and it will cost considerably less. A typical budget (calculated on the basis of three months -- 13 weeks -- for the study) would be as follows:

Salaries:

2 Technicians at $5/hr. x 40 hrs./week x 13 weeks = US$5,200		US$ 5,200
Admin. Services (office, materials, secretary, draftsman, etc.) $6/hr. x 40 hrs./week, x 4 weeks = US$960 (This service is needed only during the final month, for preparation of the report.)		960
Per diem:		2,380
1 Technician (covering 5 districts) 70 days at $17/day =	$1,190	
1 Technician (covering 4 districts) 70 days at $17/day	1,190	
	2,380	
Travel: (to and from the district, and within the district) 9 districts x $150/district (average)= $1,350		1,350
Publication: (printing, publication, misc. costs)		450
TOTAL COSTS FOR CONDUCTING THE FEASIBILITY STUDY:		US$ 10,340

Finally, an evaluation must be made of the transportation system, after it has been in operation for several months. Operationally, this study would be conducted in a manner similar to the evaluation of the Radio Communications System, and the costs involved would be the same: US$ 2,371

Thus, the overall costs of the system include:

Vehicle-related costs:	US$543,720
Feasibility study:	US$ 10,340
Evaluation of the system:	US$ 2,371
TOTAL COSTS FOR ESTABLISHING A TRANSPORTATION SYSTEM:	US$556,431

4.7.2.3 Space

The parking area for each District Center for Educational Development must be large enough to accommodate the six four-wheel drive vehicles of the rural and urban district directorates and a moderate number of motorcycles. Service facilities also must be adequate for these vehicles.

4.7.2.4 Personnel

Conceivably, up to 54 chauffeurs would have to be hired, to drive the four-wheel vehicles on the district level. This, of course, is exaggerated, and the number will doubtlessly be much smaller. Nevertheless, where new chauffeurs have to be hired, new "items" will have to be created, and the cost of salaries included in the SIDA budget. Additionally, new "items" will have to be created and salaries budgeted for one mechanic and two assistant mechanics for each District Center for Educational Development -- a total of 27 persons in the nine districts.

4.7.2.5 Training

The use of four-wheel drive vehicles is so common in Bolivia, that there shouldbe no problem in finding chauffeurs familiar with the handling of them. The use of motorcycles/motorboats does present a problem, and the supervisors who purchase them must be given instruction in the operation and minor maintenance of the vehicles. It must be stipulated in the contract with the supplier that such instruction will be provided, and that operation and service manuals will be furnished. Most importantly, the service personnel which is to maintain/repair the vehicles in the District Centers of Educational Development must receive thorough training in the servicing of all the district vehicles -- whether automobile, motorcycle, or motorboat. This training must also be provided by the seller of the vehicle, and it should be so stipulated in his contract. (Thus, probable training costs were included in vehicle costs, in the list elaborated earlier.)

4.8 National and/or District-level Conferences/Congresses

Presently, the amount of lateral contact among educational colleagues on a given level is minimal. There are no set, established means for district directors, supervisors, school/nucleo directors, etc., to get together with their counterparts from other districts (or even within the same district), to discuss educational problems in general and the problems peculiar to their levels in particular, to exchange viewpoints, to share professional news, etc. The Bolivian educational system functions as a series of nodes: Each node is a part of and a contributor to the whole, but it is generally isolated from the whole. At the lower levels, this isolation (and the perception of it) is virtually total.

To ameliorate the situation, it is suggested that a series of planned, regularly-scheduled, national and/or district-level conferences/ congresses be initiated. These conferences/congresses could, respectively, bring together national officials and district directors/supervisors, district directors only, supervisors only (perhaps by area of specialization), school /nucleo directors only, etc. (They *do not* have to include the entire number of officials at any given level, at any given time; *ergo*, in a district-level conference for nucleo directors in Chuquisaca, some 50 of the total number of directors could be selected for participation at one time, with 50 others chosen for the following conference, etc.) Such conferences/congresses could include discussions on education in general and Bolivian education in particular, material pertinent to the specific level/area in which a given conference was being conducted, educational workshops, the participation of foreign experts and/or qualified Bolivians in or outside of the educational sector. (Clearly, the specific content would have to be planned separately for each individual conference; thus, a special group would have to be organized for the purposes of planning, implementation, coordination, etc.)

If conducted properly, such conferences/congresses would fulfill the objective alluded to above. They would allow broader and deeper participation in educational policy-making; they would permit the sharing and improvement of professional viewpoints, knowledge, experience, and standards; they would increase morale at all levels of the system.

Obviously, the sepcifications for the conferences/congresses(or for any particular one)cannot be given here. These would be determined by the coordinating body established to manage the conferences. Certainly, such specifications must include content, agenda, and format for each conference; all logistical decisions (dates, locations, physical accommodations, prior information to participants, availability of lodging, necessary materials/equipment); the costs involved; the determination of speakers and outside-participants, etc.

As always, costs are the immediate concern. Such meetings can be expensive, especially if they are conducted on a massive scale; but, of course, costs will depend on the specifications elaborated by the coordinating body. Plans should not be so grandiose that they place a financial strain on the system; neither should budgets be so limited that they undermine the effectiveness of the reunions. Again, a small operating budget for this purpose is included in the Ministry of Education - USAID/Bolivia loan/grant agreement. Additional sources of outside financing/assistance should be sought, including the contribution of the time and expenses of outside speakers/participants by other governments, universities, etc.

One definite expense must be anticipated -- short term technical assistance (probably by a foreign expert), to aid the coordinating body in planning, implementing, and evaluating the initial conferences/congresses. At present rates, the cost of such assistance (contemplating a six-month consultancy) would be as follows:

Salary: 1 advisor for 6 months at $2,000/month	$12,000
Per diem: 1 Advisor for 180 days at $22/day	3,960
Travel: Round trip air transportation, USA-LaPaz	800
Total costs for short-term consultancy:	$16,760

This cost alone (and, again, this is only one small item) is probably enough to cause some consternation among budget-minded educational planners. However, the effects of such investment on educational participation, standards, and morale -- which cannot be measured by financial considerations -- would be well worth the cost of the conferences/congresses.

4.9 Newsletter for Educators and Administrators

One of the most useful tools (potentially) in the dissemination of news, standards, and ideas in any professional area is the newsletter or professional journal. It can reach the most isolated individual or outpost, bringing the most recent information which is directly relevant to a given area of activity, or which generally contributes to the broadening of knowledge and experience. And, if used properly, it can allow for feedback, thus creating something of a two-way channel of communication. Thus, the establishment of such a newsletter for teacher and administrative personnel in the Bolivian educational system is highly recommended.

A working paper outlining the basic considerations (philosophical and technical) in the initiation and publication of an educational newsletter appeared in Quarterly Report No. 6 (June, 1973) of the Technical Assistance Project of the San Jose (California) State University Foundation, Inc. It can serve to provide the initial guidelines for decision-making by an editorial policy board (the establishment of which is the logical first step in the implementation of such a project).

Again, the costs of publication of a newsletter would depend entirely on the pertinent decisions made by the policy board -- most notably the style and content of the newsletter, and the frequency of publication. Thus, specific costs cannot be given at this point; certainly, they would include: Office space, materials and equipment, and secretarial help; personnel (perhaps a director, two editors, and a draftsman); costs of news-gathering; purchase of books and of subscriptions to professional magazines and newspapers; costs of supplies and materials for actual publication; publication (this service could be provided through the existing facilities of SATE); distribution.

Once more, short-term technical assistance is probably necessary during the period of editorial decision-making, formation, and initial publication. Assuming a three-month consultancy by a foreign advisor, costs would be:

Salary: 1 Advisor for 3 months at $2,000/month	$6,000
Per diem: 1 Advisor for 90 days at $22/day	1,980
Travel: Round-trip air transportation, USA- La Paz	800
Total costs for short-term consultancy:	$8,780

Again, this cost and the actual expenses of publication are nominal, in comparison with the salubrious effects which the newsletter could have on the standards and morale of Bolivian education.

(Note: It is strongly suggested that the newsletter start on a small scale -- ergo, four to eight pages, newspaper style, free distribution -- until its news sources, readership, and general capacity are established; then, it may gradually increase its scope and ambition.)

4.10 Miscellaneous Suggestions

Sundry problems exist within the administrative sector of the educational system which are at least partially caused by poor communications and which -- by virtue of the friction which they engender -- further exacerbate the situation. Many of these are a direct result of excessive centralization and concentration of authority and decision-making power within the system; as such, they will doubtlessly be alleviated when the Administrative Reform is fully implemented. Nevertheless, they deserve mention here.

At most levels of the educational system -- and this includes most of the departments within the Ministry itself -- virtually no administrative decision-making per se takes place. What passes for decision-making is merely the rote performance of duties, based on incoming information or usual, habitual practices. The result of this is that all decision-making -- even the most minor, procedural, and automatic -- must take place at the very highest levels of the Ministry, placing an inordinate and unnecessary burden and time-drain upon the Minister and his top officials. This problem could be solved (and, hopefully, will be, by the Administrative Reform) by the simple expedient of a rational and specific division of labor and responsibilities -- with the commensurate authority and final decision-making powers to complete these responsibilities. (Responsibility without adequate authority is illogical and untenable.)

This division of responsibility -- specific, definite, authorized, and complied with by all concerned -- must take place at all levels: Within the Ministry, and from the Ministry to the district directors and supervisors, right down to the school and nucleo/seccional. (Clearly, the determination of responsibilities for any given department, office, or level should be based upon the corresponding documents/guidelines prepared for the Administrative

Reform.) Such an arrangement would help to end dissension and such ludicrous procedures as the direct intervention of the Ministry in the naming of lower-ranking officials and even teachers (and, usually, on the basis of political considerations) on the district level -- with virtually no input from the district directorates. (Decision-making belonging obviously, implicitly, and inherently to one level should in fact be left to that level. If certain decisions are to be made on the basis of political considerations, then a competent, politically acceptable and trustworthy person should be appointed to the particular position at the particular level where the decision should logically be made.)

On the district level, a major problem results from phsyical concentration, rather from the concentration of authority. Supervisors responsible for particular zones should be moved away from the district capitals and into their zones. Only in this way can they assure adequate fulfillment of their communications and supervisory functions. (The feasibility study performed in conjunction with the Radio Communications System can be most helpful in formulating a base for the division of any given district into supervisory zones, by elaborating the pertinent geographical and population considerations. As has been noted earlier, the full implementation of both the Radio and Transportation Systems is contingent upon the establishment of such supervisory zones.)

District directorates and SIDA offices must be given air mail franking privileges or -- alternatively -- an adequate budget to cover these costs. Clearly, guidelines and measures must be formulated, to preclude personal abuse of this privilege. Similarly, nucleo directors should be given telegraph franking privileges, for emergency communication with the district directorate. Adequate duplicating facilities must be provided on at least the district level (and, ideally, on the zonal level); thus, adequate copies of written communications could be prepared for district-wide distribution, avoiding the present need for re-copying such communications (often by hand, at the nucleo level) and the time-loss which results.

Facilities must be provided, in the interior, for the production and distribution of didactic materials and school equipment. If it were decentralized (with, for example, installations in Santa Cruz and Tarija, as well as La Paz), SATE --Servicio de Ayuda Tecnica Escolar -- could perform this service, on a nation-wide basis. Quarterly Report No. 6 (June, 1973) of the Technical Assistance Project of the San Jose (California) State University Foundation, Inc., included a document elaborating the basic requirements for a feasibility study on the autonomy and decentralization of SATE. The costs of such a study would be similar to those given for the feasibility study on a Transportation System -- i.e., $10,340 -- with essentially the same cost components. Without question, such a national service is needed. Thus, the Direction of Administration or the Direction General of Education should investigate the possibility of conducting the feasibility study (which is indispensable) and should seek ways of funding the study.

Finally, but by no means least in importance -- we would suggest that all nucleo directors be required to know how to speak the language of the locale in which they live and work. (This is less critical, but nevertheless important, for directors of urban schools in the provinces.) This is essential, if they are indeed to be able to win the confidence, cooperation, and aid of local campesinos, "padres de familia" organizations, etc. The benefit of good community relations to education on the local level is obvious, but the benefit to the communications system is just as great. This is especially true for any district which would choose the Chuquisaca system, where the good will of local campesinos is crucial.